September 28, 1942

STEEL

PRODUCTION • PROCESSING • DISTRIBUTION • USE

ESTABLISHED 1882

TECHNOLOGY DEPT:

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DETROIT

LEWIS FOUNDRY & MACHINE
DIVISION OF BLAW-KNOX CO.
PITTSBURGH
ROLLS & ROLLING MILL MACHINERY

Wartime Problems

ROUND THE WORLD EVERY 8 DAYS!

That's the rim-travel of a rotor in many electric motors now working all around the clock on Victory production!

Motors that worked 1800 hours in a peacetime year are now working a full *8700 hours a year.* Result: problems of maintenance are *quadrupled.* And more...

For motors must receive *finer* care than ever. Whose motors last longest may have a lot to do with who *wins* this war!

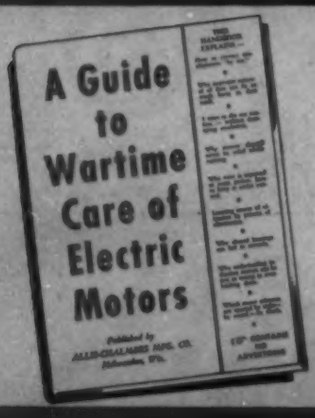
CALL FOR Wartime Solutions

AN ATTACK IS THE BEST DEFENSE

Taking the initiative against wear always has been sound maintenance practise. In wartime, it's a *vital* practise!

First, because wear now works *faster.* Second, because avoidable breakdowns *cannot be afforded* in the victory effort!

Beating wear to the punch is the basic principle of a new Allis-Chalmers publication: "A Guide to Wartime Care of Electric Motors." You'll find it *invaluable!*



Order This Free Book!

Every engineer, production manager and maintenance man will want a copy of "A Guide to Wartime Care of Electric Motors" for his technical library—and for immediate use, too!

It outlines the "natural enemies" of an electric motor and the most effective methods of combatting them. To be of maximum use to you, it applies to *all makes* of standard, general-purpose motors.

It's liberally illustrated — contains no advertising.

Tear out the order form now and send in to Allis-Chalmers for *your* free copy of this timely handbook.

ALLIS-CHALMERS MFG. CO.
Advertising Dept.
Milwaukee, Wisconsin

Gentlemen:

Yes, I would like to receive *free of charge* "A Guide to Wartime Care of Electric Motors."

Name:.....

Title:.....

Company:.....

Street Address:.....

City and State:.....

A 1535-14

ALLIS-CHALMERS
MILWAUKEE-WISCONSIN

WE WORK FOR VICTORY WE PLAN FOR PEACE

TECHNOLOGY DEPT.

Metallurgical First-Aid

If your plant is using Bethlehem alloy or carbon steel in war production, and some problem involving steel threatens to curtail output, don't temporize. Time is too short for that.

Get a Bethlehem metallurgist on the phone. Bethlehem metallurgists are specialists at ironing out production kinks. They've been doing it for years in plants all over America.

Here's an example of a job they did for one customer.

The customer was making hot oil-pump shaft sleeves and wanted to combine corrosion-resistance with the ability to withstand the abrasion resulting from the packing material. To meet both conditions, a composite sleeve was developed—a sleeve with a corrosion-resisting steel body and a hard-surface insert.

That led immediately to a further problem: How to weld these two materials together without cracking the insert during cooling?

Bethlehem metallurgists recommended a low-carbon corrosion-resisting steel having an Ar 1 critical above 1200 deg. F., and a straight-line cooling curve below that temperature. This steel, when welded to the insert, expanded and contracted at a high enough temperature to prevent cracking. This composite sleeve is now in regular production.

Under the stress of war production new steel problems are cropping up every day. Bethlehem metallurgists have met and solved almost every kind of problem connected with steel, its treatment and application. Their accumulated experience and know-how are yours to call upon. If you are engaged in war production and have a problem relating to steel, they'll do their best to help you.

BETHLEHEM STEEL COMPANY

HURLING DESTRUCTION

AT THE RAIDERS!

Fighting on every front, on land, on ships, American antiaircraft guns hurl destruction at the enemy—crashing down their planes, smashing their air offensives. From 37 mm to 105 mm, these weapons pour from our production lines with incredible speed.

Part of the ability to produce these guns in such quantities lies in the speed with which barrel forgings are finish machined on Monarch lathes. Monarch's automatic sizing (by which the tool automatically produces the desired contour) is turning out from 2½ to 3 times more barrels per day than by manual control . . . always with the required high standards of accuracy.

Although we're building twice as many Monarch lathes in 1942 as in 1941, you'll find no let down in Monarch quality. Their ability to do more work per day, with accuracy and precision, is being proved in thousands of plants engaged in production for Victory.

THE MONARCH MACHINE TOOL COMPANY • • • SIDNEY • OHIO

From 2½ to 3 times more barrels per day is the record of this Monarch automatic sizing lathe.

MONARCH LATHES

COVER THE TURNING FIELD

BEHIND THE SCENES

It will cost a lot of money to win the War. It will cost a lot more to lose it.

—Fibber McGee and Molly.

War Costs Money

□ The War and Defense Information Center of the Cleveland Public Library has compiled a swell bulletin on the costs of war materials. If you have anything to do with your company house organ, posters, or similar activities it will pay you to write for a copy of bulletin No. 7 for source material. Here are a few examples of how war costs money:

$150 will buy 1 parachute.

$240 will fire a 50 caliber anti-aircraft machine gun 1000 times.

$15,000 will buy 1 pontoon bridge.

$114,000 is the cost of a heavy tank (before mounting guns).

Airplanes cost $6 to $7 a pound; battleships $1 per pound.

It costs about $50,000 to make one bomber flight if all the elements of depreciation on the plane, etc. are counted.

And it costs about $1600 to fire a 16-inch gun from a battleship.

M-99

■ As you probably know the government has ordered that advertising plates may not be held for more than a year after use, much to the relief of many a publisher who has had to struggle with an accumulation of old engravings, waiting the day they might be used again.

Geo. L. Randall, advertising manager, Wickwire-Spencer Steel Co. apparently shares our feelings completely but expresses them much more vividly than we have been able to. He writes:

With you, we say hats off, by God, to the WPB for its Order M-99!

I for one have never known why so many of us poor advertising clucks hang on so long to our old plates, as though they were rare old masterpieces.

I therefore beseech you now, hereafter and evermore to do us the personal kindness of junking any and all advertising plates of ours that may be cluttering up your press room as soon as they're three months old, unless otherwise instructed on some specific electro.

And if you find it convenient, which in your judgment is best please junk 'em in the manner calculated to help knock the hell out of those few enemy degenerate punks abroad who are still so dumb as to think they can lick you and me and the whole United States of America and all the rest of the civilized world united against them.

Yours for a smashing victory!

Industrial Heroes

□ Working next to tons of molten slag at the base of the largest electric furnace in the world, the men of the mechanical crew of Monsanto Chemical Co.'s Monsanto, Tenn., phosphorus plant recently turned a threatened breakdown into a brilliant production victory. When the furnace developed a break the men volunteered to make repairs while the unit was in operation, and the success of the job insured the continued record-breaking flow of vital elemental phosphorus to war uses. Not a single hour's production was lost.

Reprint

■ The November-December issue of Army Ordnance will carry STEEL's recent articles on "Training Operators" and "The Rheotron."

Be A Winner

■ We see where the *National Union Farmer*, official publication of the National Farmers Union has announced a nation-wide essay contest on "How to Live on $25,000." The purpose is to "assist high-income individuals and families to adjust their expenditures, lives and thinking" to the expected law limiting net salaries to that amount.

And guess what the first prize is! Does it give the winner a chance to practice what he preaches? It does not. First prize—$25.00.

Helping Hands

□ To meet the critical harvesting situation in California war plant workers are spending Sundays harvesting fruit that would otherwise spoil. The fruit will be canned for use by America's army, and for shipment under the lend-lease program to allies on all fighting fronts.

William Diaz, a welder in a machine shop, made the suggestion, and a school board supplied a bus to carry the men from Emeryville to Santa Rosa.

Army Scrap

□ Aberdeen Proving Ground has salvaged 11,250,000 pounds of scrap metal. Items ranged from an ornamental cannon ball to a 42-ton tank.

Bumper Crop

□ Which reminds us that we have wanted to say "Swell idea" to Westbrook Pegler's suggestion of turning in your automobile bumpers for scrap. If someone would furnish stickers reading "I've given my bumpers for scrap" and arrange for their distribution, we predict, with Mr. Pegler, that the idea would spread like wildfire.

Reverse Nags

□ "Pittsburgh Phil" has an eagle eye and what's more we'll wager a sawbuck across the board he's spent more than one day in his life hanging on the rail. He writes:

In these times of stress, perhaps a little humor injected every now and then will do all of us a world of good.

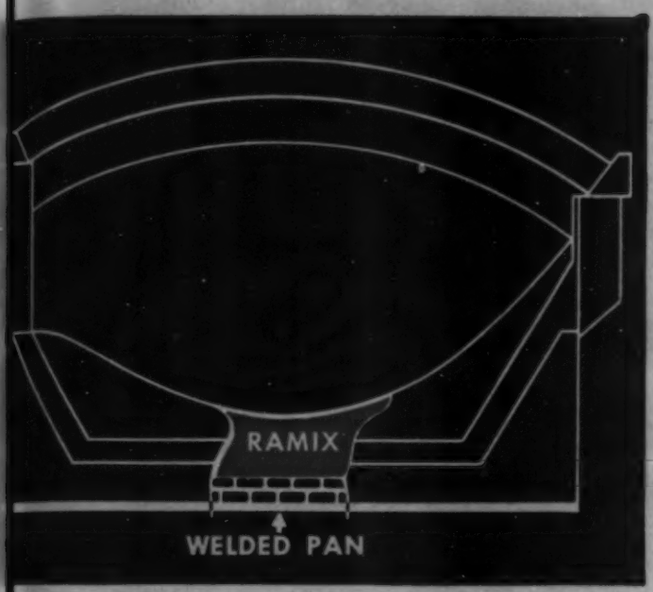
For a long time we've been wondering why Whirlaway couldn't seem to win a stake race in Massachusetts. Now we think we've found the solution, and it appears in your August 10 issue —page 15. You have the horses running the wrong way. Take a gander at the guide rails and see if what we say is not so.

'Tis so—

Vol. 111, No. 13, September 28, 1942, issue of STEEL, published every Monday at Cleveland, O. Entered as second class matter at the post office, Cleveland, O., under act of March 3, 1879. U. S. and possessions, Canada, Mexico, Cuba, Central and South America, 1 year $6; 2 years $10; all other countries, 1 year $12. Current issues, 25c. Yearbook of Industry issue, $2.00.

Editorial Contents—Page 17

"How quickly can you repair a bottom that a heat's gone through?"



How Ramix was used to make a permanent repair of a large hole cut in an open hearth bottom when a heat went through.

Ramix is a scientifically prepared magnesite refractory, shipped in bags, ready for quick installation. It needs only to be tempered with water before ramming.

• The first time that question was posed to a Basic Refractories Field Engineer was two years ago, when Ramix was just earning its reputation as a dependable cold-ramming refractory for permanent repair of open hearth bottoms.

There was no hesitation in the Basic Engineer's answer: "In a very few hours after you get the pan welded." And the job was actually completed—pan welded, Ramix tamped in, bottom dressed and the furnace ready to charge—in less than 24 hours after the break through.

Here's the simple procedure, followed in this and several other break-through cases since then: As soon as the furnace was cool enough, new plate was welded solidly to the pan from below. Next, Ramix tempered with water was shoveled into the hole (approximately 6 x 3 feet) and tamped in to conform to the old bottom contour.

Then, after the furnace was brought back up to temperature, banks and bottom were washed down and the entire hearth dressed lightly with magnesite. The furnace was then ready to resume operation, with a *permanent* bottom repair that has stood up under hundreds of heats since then.

Basic Engineers are "standing by" for all steel plants nowadays. They are *your* refractories service men and are always glad to assist. Don't hesitate to call upon them for help.

BASIC REFRACTORIES FOR THE STEEL INDUSTRY

MAGNEFER—Dead-burned dolomite for hearth and slag line maintenance.

SYNDOLAG—Dead-burned, rice size dolomite for maintenance.

BASIFRIT—Quick-setting magnesia refractory for new construction, resurfacing and maintenance.

OHIO MAGNESITE—Domestic dead-burned high-magnesia grain refractory, equal to Austrian.

695 PLASTIC—Strong plastic basic refractory for hot and cold repairs.

RAMIX—An air-setting, time-saving basic refractory for rammed hearths and cold repairs in open hearth and electric furnaces.

GUNMIX—A basic refractory for maintenance of furnace walls, used for use with a cement gun.

HEARTH PATCH—For deep hole patching and other quick repairs in the basic open hearth.

RAW DOLOMITE—Washed open hearth dolomite in rice size and standard ¼-inch.

BASIC REFRACTORIES INCORPORATED

FORMERLY BASIC DOLOMITE, INC.

CLEVELAND, OHIO

Quick help on metallurgical refractory problems!

EVERY Metallurgist sooner or later runs into a stubborn problem on refractories. Today particularly, with the emphasis on production, you want a quick answer and the right one. Here's where The Carborundum Company can help.

For more than twenty-five years Carborundum Brand Refractories have been solving many of the metal industry's furnace problems. These refractories have been extended to include over sixty-five standard varieties in regular production and many special modifications thereof to meet unusual conditions, all of which have been proven in service. They are used in the form of muffles, hearths, supports or complete linings in all types of furnaces. Among them may be mentioned furnaces for forging, drawing, tempering, hardening, carburizing and annealing; furnaces for both ferrous and non-ferrous melting.

In addition, you are offered the expert knowledge and practical skill of highly trained engineers to assist you in the proper selection and use of these specialized refractories—to make certain that the right material is used in the right place. They are ready to help you, on short notice. So next time you run into refractory difficulties call in The Carborundum Company. A letter to our nearest branch office will receive prompt attention.

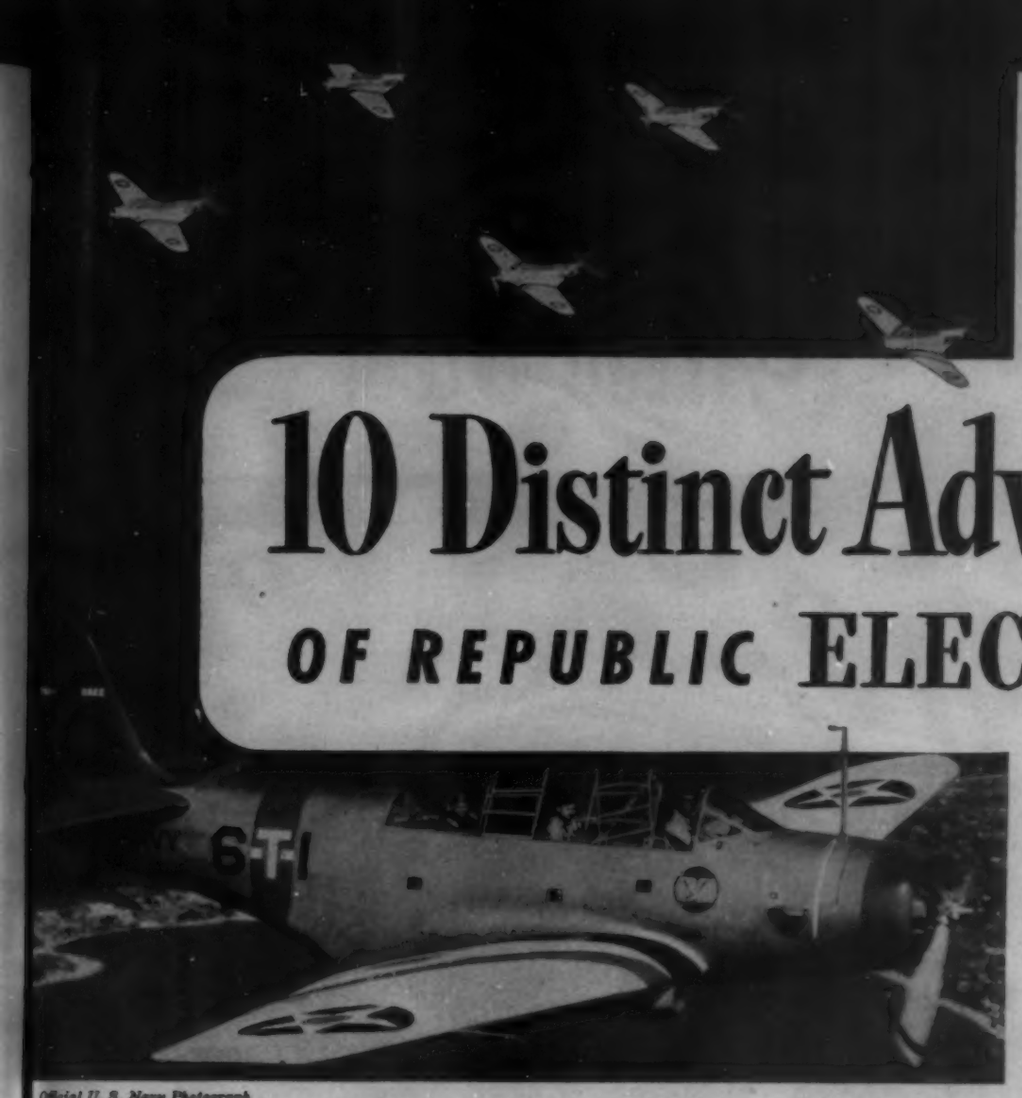
CARBORUNDUM

Refractory Division, **THE CARBORUNDUM COMPANY,** *Perth Amboy, N. J.*

REG. U. S. PAT. OFF.

District Sales Branches: Chicago, Philadelphia, Detroit, Cleveland, Boston, Pittsburgh. Distributors: McConnell Sales and Engineering Corporation, Birmingham, Ala.; Christy Firebrick Company, St. Louis, Mo.; Harrison & Company, Salt Lake City, Utah; Pacific Abrasive Supply Company, Los Angeles, San Francisco, Calif.; Denver Fire Clay Company, El Paso, Texas; Smith-Sharpe Company, Minneapolis, Minn.

(Carborundum is a registered trade-mark of and indicates manufacture by The Carborundum Company)



10 Distinct Advantages OF REPUBLIC ELECTRUNITE AIRCRAFT TUBING

Official U. S. Navy Photograph

Because it is made from *flat-rolled* steel, cold-formed to tubular shape and then *electric resistance welded,* Republic ELECTRUNITE Aircraft Tubing offers ten distinct advantages—many of them not consistently obtainable by other processes.

1. **Uniform Diameter**
2. **Uniform Wall Thickness**
3. **Uniform Concentricity**
4. **Uniform Strength (*with a weld as strong as the wall*)**
5. **Uniform Weight**
6. **Uniform Ductility**
7. **Uniform Hardness**
8. **Uniform Weldability**
9. **Uniform Scale-Free Surface**

The 10th advantage is *uniform freedom from all injurious defects*—insured by test of every length by a specially-developed non-destructive electric method.

Republic ELECTRUNITE Aircraft Tubing meets specification standards of the U. S. Army Air Corps; Bureau of Aeronautics, U. S. Navy; and the Civil Aeronautics Administration.

It is made of S.A.E. X-4130 steel in sizes from ⅛″ O.D. to 1⅝″ O.D.—.028″ to .065″ wall; of S.A.E. 1025 steel in sizes from ⅛″ O.D. to 4″ O.D.—.028″ to .148″ wall; and of ENDURO* Stainless Steel in standard analyses in sizes from ⅛″ O.D. to 3″ O.D.—.028″ to .120″ wall.

Write for further information.

STEEL AND TUBES DIVISION
REPUBLIC STEEL CORPORATION
CLEVELAND • OHIO

Berger Manufacturing Division • Niles Steel Products Division
Union Drawn Steel Division • Calvert Division • Truscon Steel Company
Export Department: Chrysler Building, New York, New York

Republic

ELECTRUNITE

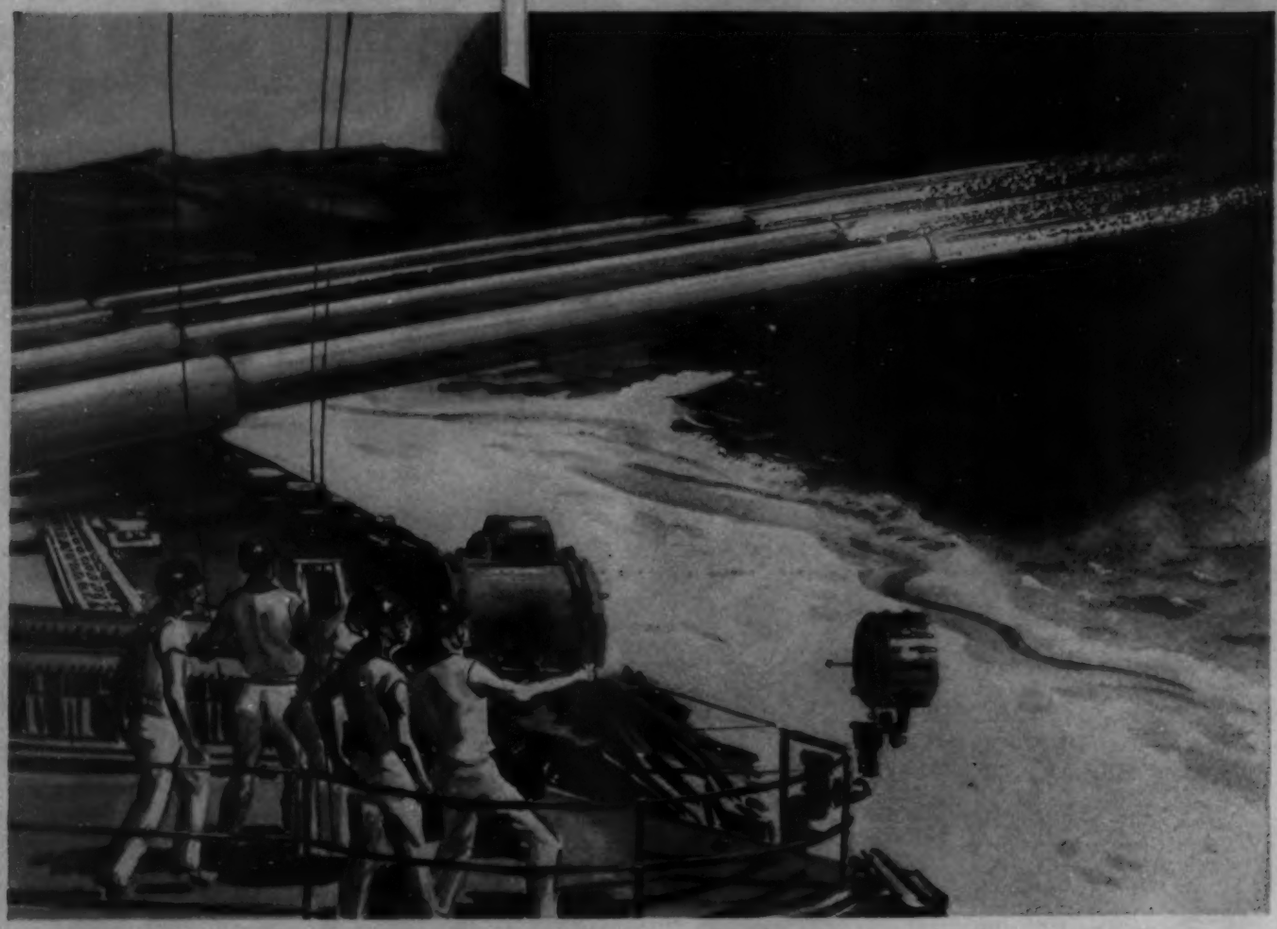
Reg. U. S. Pat. Off.

ELECTRIC RESISTANCE WELDED TUBING

Also Boiler Tubes • • • Condenser and Heat Exchanger Tubes

*Reg. U. S. Pat. Off.

Weirton Steel



. . . and battleships

To build our huge battleships—those bristling floating fortresses—requires steel in tremendous quantities.

The mills of the Weirton Steel Company are throbbing with activity, and Weirton's "men of steel" are working at top speed to help supply the nation's shipyards—to make our fleet the most formidable in the world.

And when the war is won, Weirton Steel will continue to meet the needs of the most exacting steel users.

WEIRTON STEEL COMPANY

Weirton, West Virginia

Sales Offices in Principal Cities

Division of

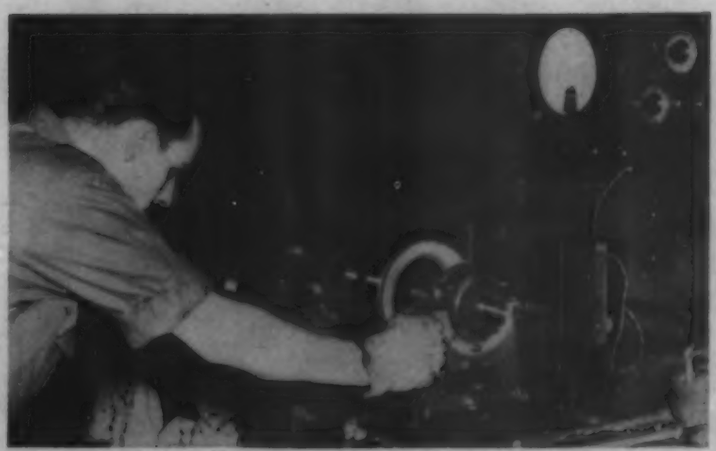
NATIONAL STEEL CORPORATION

Executive Offices · Pittsburgh, Pa.

WATCH IT, Professor! You're about to lose something—*your balance!* And that might cut short your whole career!

And to men in the field of mechanics, balance is no less important! In any assembly where parts rotate at high speeds, unbalanced static and dynamic forces mean vibration and noise. They mean excessive wear—a short life and a not-so-merry one!

Gisholt Balancing Machines enable you to measure unbalance vibrations as small as .000025". Because you can now do it so accurately, so quickly, so economically—no vital rotating members in any good machine need pay the heavy penalty imposed for unbalance.



GISHOLT DYNETRIC MACHINES *indicate corrections required for all unbalanced forces—in a matter of seconds—and reduce costs accordingly. Literature on request.*

GISHOLT

GISHOLT MACHINE COMPANY, 1217 East Washington Avenue • Madison, Wisconsin

LOOK AHEAD . . . KEEP AHEAD . . . WITH GISHOLT IMPROVEMENTS

TURRET LATHES · AUTOMATIC LATHES · BALANCING MACHINES

BETTER TANK GEARS... IN A HURRY!

WHEN tank production went into high, transmissions were needed fast. And what transmissions! Giant gear assemblies weighing up to 8000 pounds . . . delivering as much as 400 h.p. to the tracks of 30-ton traveling fortresses. Smaller transmissions, too, for smaller tanks, but still oversize, rugged . . . far larger than any ever made in quantity production before.

Only tough alloy-steel gears can stand this punishing service . . . machining is a difficult problem. Shell Lubricants helped meet the urgent need for speed. One plant, changing to a new type of Shell Cutting Oil, was able to increase the depth of cut 30%, and still get a better finish. Other manufacturers reported gains almost as good.

• • •

This is only one of the many ways Shell Industrial Lubricants are speeding up America's war production . . . only one example of what these improved products may be able to do in your own plant. Are you sure you are getting top production from *all* of your equipment? Why not have a talk with Shell?

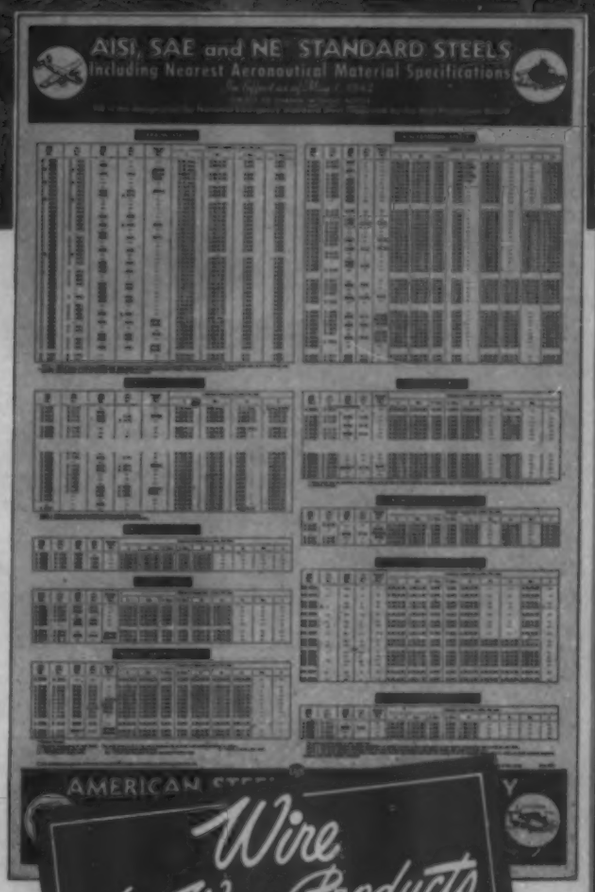
WAR PRODUCTION SPEEDS AHEAD ON

SHELL

SHELL

INDUSTRIAL LUBRICANTS

★ ★ ★ ★ ★ ★ ★ ★ ★



At your disposal...

A WEALTH OF HARD-EARNED EXPERIENCE

NO one can deny the farsightedness of the WPB in fostering the development of the National Emergency Steels as alternates for steels of higher strategic alloy content.

These new, low alloy steels cover a wide range of properties. Many of them are actually outperforming the steels previously used. If you really want to help Uncle Sam stretch the supply of critical nickel and chromium, you'll put them into production without delay. To help you adapt them to your special needs with the minimum interruption of your established procedure, the services of our experts are freely offered.

Where your fabrication methods must be altered or heat treatments changed, or both, these specialists in steel and wire are prepared to show you how it can be done. And in the difficult and necessary task of choosing the right alternate steels to cover your requirements, their advice will save you time and trouble. We invite you to make use of their experience in furthering the common cause of Victory.

Get this FREE Chart!

It lists the National Emergency Steels (Series NE 8000) and other steels such as Series AISI-A4000, specially recommended for war production purposes. Use it as a practical and handy guide whenever necessary. For your copy write on your Company letterhead to American Steel & Wire Company, 408 Rockefeller Building, Cleveland.

AMERICAN STEEL & WIRE COMPANY

Cleveland, Chicago and New York

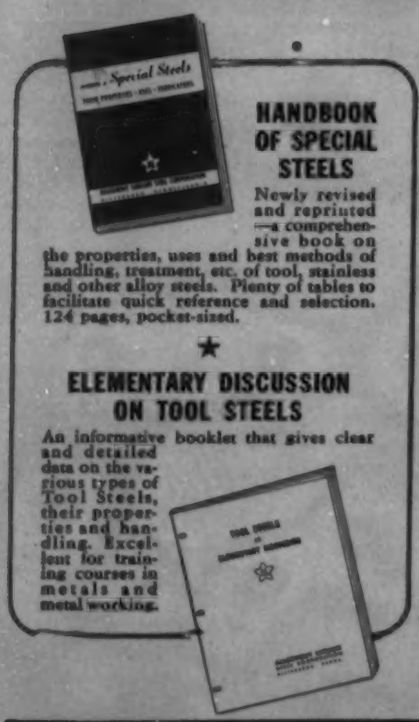
Columbia Steel Company, San Francisco, *Pacific Coast Distributors*
United States Steel Export Company, New York

Wire for War Products

COLD FINISHED STEEL BARS · COLD ROLLED
STRIP STEEL · MANUFACTURERS' WIRES
STAINLESS STEEL · SPRING WIRE
WELDING WIRE · WIRE SPRINGS

UNITED STATES STEEL

INFORMATION IS *Ammunition* FOR THE TROOPS ON THE PRODUCTION LINES



HANDBOOK OF SPECIAL STEELS

Newly revised and reprinted —a comprehensive book on the properties, uses and best methods of handling, treatment, etc. of tool, stainless and other alloy steels. Plenty of tables to facilitate quick reference and selection. 124 pages, pocket-sized.

★

ELEMENTARY DISCUSSION ON TOOL STEELS

An informative booklet that gives clear and detailed data on the various types of Tool Steels, their properties and handling. Excellent for training courses in metals and metal working.

IN more than one sense, and all of them very real, information is ammunition in these days of metal-working pressure.

Complete information on Tool Steels in the hands of production executives leads to the conservation of these highly strategic steels; to the selection of types better suited to individual jobs; and in many cases, to vast improvements in performance. (*A diesel engine builder, for example, found that DBL High Speed Steel reamers averaged 800 pieces per grind against a previous maximum of 200 pieces with 18-4-1.*)

The Allegheny Ludlum "Handbook of Special Steels" is a bible of data for production men, and our "Elementary Discussion on Tool Steels" is invaluable for use in apprentice and training courses. ● *Write for the copies you need.*

Address Dept. T-243

Allegheny Ludlum
STEEL CORPORATION
GENERAL OFFICES: PITTSBURGH, PENNSYLVANIA

64

STEELWELD PRESSES NOW SERVING THE AIRCRAFT INDUSTRY

Steelwelds are playing an important role in the manufacture of airplanes for many leading concerns.

They are being used for wing, fuselage and other sections. Forming is done either with standard dies or rubber forms. Corrugating and multiple-punching are easily performed.

Steelwelds are simple to operate. They produce accurate parts in fast time on a continuous production basis. Dies are easily and quickly changed. A large range of standard size machines available.

Steelweld representatives in all principal cities.

Multiple-punching 150 holes ranging from .078 to .250 in size.

Punches are set to accurate scale readings as close as ¼" centers, and are individually gagged with built-in strippers. Steelwelds can be set up quickly for forming, multiple-punching, etc.

CATALOG No. 2002 gives complete construction and engineering details. Mail request for free copy on your company letterhead.

GET THIS BOOK!

THE CLEVELAND CRANE & ENGINEERING CO.
STEELWELD MACHINERY DIVISION
1125 EAST 283RD STREET • WICKLIFFE, OHIO.

MANUFACTURERS OF • CLEVELAND CRANES • CLEVELAND TRAMRAIL • STEELWELD BENDING PRESSES

STEELWELD
BENDING PRESSES

GENERAL SALES AGENTS: CYRIL BATH & CO., E. 70TH & MACHINERY AVE., CLEVELAND

NEWS from the Scrap Front

TIPS FROM OTHER "WASTE WARDENS" THAT MAY HELP YOU DO A BETTER JOB OF "GETTING IN THE SCRAP"

WRECKS ASPHALT PLANT TO GET WAR SCRAP—Demolition of this 26-year-old asphalt plant by an eastern refin ng company is yielding over a thousand tons of precious scrap, enough to make the steel for 70 "General Lee" tanks . . . *Do you have any steel structures, idle now and of doubtful future value, which should be wrecked to release the scrap metal they contain?*

NO HOARDING HERE—A midwest novelty manufacturer (now engaged in war work) recently turned in over two million pounds of metal parts, tools and machinery at scrap metal prices . . . *Are you holding idle stocks of obsolete and useless metal parts and equipment for some uncertain future need?* In most cases they're worth more now to your country as scrap than they'll ever be to you.

SEGREGATION MINIMIZES SCRAP LOSS— A western aircraft plant has more than doubled its scrap collections through a systemat'c salvage program, directed from a central office. All metal scrap is segregated into solids and machinings, and also by alloy content, right at the machines. Scrap containers are color-banded and labeled to clearly identify what goes into each . . . *Have you organized an efficient scrap collection system at your plant? Does it provide for careful segregation?*

THE SCRAP IS COMING IN . . . BUT NOT FAST ENOUGH!

WE have proof that industry is co-operating in the drive for scrap metals . . . proof measured in thousands of tons. But mills must get *more* iron and steel scrap if they are to meet the gigantic needs of war industry.

Don't forget . . . steel gets to work on the battlefront more quickly when plenty of scrap is available. Scrap is already metallic; therefore, less ore needs to be converted into pig iron per ton of steel produced. By remelting scrap to make new steel, more tons of high-quality products can be turned out in a hurry for war purposes. So make it your personal war assignment to see that your organization does a thorough, continuous job of "getting in the scrap." Cooperate closely with your local Industrial Salvage Committee.

FLOOR SWEEPINGS ARE "PAY DIRT"

Every day sweepings at an eastern war plant yield more than 1000 pounds of usable small parts and a big pile of scrap metal. Janitors s'ft sweepings through wire mesh. Then magnetic separators and mechanical sorting devices finish the job. Usable parts then go back to stock, and scrap is shipped for salvage . . . *Are you gleaning every pound of metal from your floor sweepings?*

AMERICAN STEEL & WIRE COMPANY, *Cleveland, Chicago and New York* · CARNEGIE-ILLINOIS STEEL CORPORATION, *Pittsburgh and Chicago* · COLUMBIA STEEL COMPANY, *San Francisco* · NATIONAL TUBE COMPANY, *Pittsburgh* · TENNESSEE COAL, IRON & RAILROAD COMPANY, *Birmingham*

UNITED STATES STEEL

★ Let this Service Help You ★

Speed up Production

of Metals and Metal Products

BELOW is a partial list of the ferro-alloys and alloying metals that we produce. Some of these are strategic materials. All of them are important ingredients for making iron, steel, and certain non-ferrous metals.

During our more than 35 years' experience in the production and use of these alloying materials, we have developed a vast fund of information about the production, fabrication, and use of iron, steel, and other metals. This reservoir of metallurgical data is available to you who work with metals to help you do your jobs in the simplest and quickest way.

This service is given practical effect by a staff of trained metallurgists who can give you on-the-job assistance. In addition, our extensive laboratory facilities are available for solving your special problems.

Perhaps, for instance, you are having difficulty getting certain alloys these days. Then let us suggest how you might use available materials and still maintain the quality of your product.

Nothing should interfere with speed and more speed in metalworking production today. Toward this end, ask us for whatever help we can give you, without obligation.

ELECTRO METALLURGICAL COMPANY
Unit of Union Carbide and Carbon Corporation

UCC

30 East 42nd Street, New York, N. Y.

"Electromet" Ferro-Alloys and Metals are available through offices of Electro Metallurgical Sales Corporation in Birmingham, Chicago, Cleveland, Detroit, New York, Pittsburgh, and San Francisco. In Canada: Electro Metallurgical Company of Canada, Limited, Welland, Ontario.

Electromet

TRADE-MARK

Ferro-Alloys & Metals

CHROMIUM
Low-Carbon Ferrochrome (in grades, maximum 0.06% to maximum 2.00% carbon)
High-Carbon Ferrochrome (maximum 7.00% carbon)
Nitrogen-Bearing Ferrochrome
S. M. Ferrochrome
Chromium Metal
Chromium-Copper
Miscellaneous Chromium Alloys

•

TUNGSTEN
Ferrotungsten
Tungsten Powder

SILICON
Ferrosilicon 50%
Ferrosilicon 75%
Ferrosilicon 80 to 90%
Ferrosilicon 90 to 95%
Silicon Metal
"Silcaz" Alloy
"Silvaz" Alloy
"SMZ" Alloy
Miscellaneous Silicon Alloys

•

ZIRCONIUM
Zirconium 12 to 15%
Zirconium 35 to 40%

MANGANESE
Standard Ferromanganese 78 to 82%
Low-Carbon Ferromanganese
Medium-Carbon Ferromanganese
Manganese Metal
Miscellaneous Manganese Alloys

•

"EM" BRIQUETS
(Patented)
Silicon Briquets
Silico-Manganese Briquets
Chromium Briquets

CALCIUM
Calcium-Silicon
Calcium-Manganese-Silicon
Calcium Metal

•

SILICO-MANGANESE

•

VANADIUM
All grades

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COLUMBIUM
Ferrocolumbium

The words "Electromet", "Silcaz", and "Silvaz" and the letters "EM" and "SMZ" are trade-marks of Electro Metallurgical Company.

Simplex Milwaukee Milling Machine—a compact, medium size machine for efficient production of smaller parts.

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The machine tool industry has established new records in war production by producing machines in quantities without sacrificing accuracy and quality . . . Kearney & Trecker has developed many such machines, among them the M-Series Simplex—the newest machine in the bed type field.

It answers the demand for a medium-sized machine to efficiently produce the thousands of small parts vitally needed for planes, tanks and guns. Because its basic design is the same as the larger machines, it has strength and ruggedness to spare.

KEARNEY & TRECKER CORPORATION • Milwaukee, Wisconsin, U. S. A.

Milwaukee MACHINE TOOLS

General Electric's training programs produce fully qualified workers quickly, p. 56

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3 Million Tons of iron and steel scrap are wanted every month . . . Are you doing your part to help America win her battle of production?

CONSERVATION AUTHORITIES RECOMMEND THESE 8 STEPS TO GET IN THE SCRAP

1 Put some one individual in charge of scrap in all departments of your business and GIVE HIM AUTHORITY TO ACT.

2 Comb the plant and yards for dormant scrap, abandoned equipment, old boilers, pipe, moulds, obsolete dies and parts, material now being destroyed which has salvage value.

3 Survey all plant equipment, particularly idle standby or discarded machines, with a view to applying or converting them to useful production.

4 SEGREGATION:
Identify, classify and segregate scrap and supervise its handling to avoid contamination. This will increase its value.

Provide separate containers, clearly marked, for each class of scrap material.

Repair or rework worn or broken cutting tools Keep unusable small pieces and turnings segregated. Even high speed steel grinding dust is valuable.

Dismantle discarded equipment promptly into its components—electrical, fastenings, lumber, etc.—so that these parts may be utilized or scrapped.

Sort blanks, short ends, cut-downs, clippings, etc., for possible reuse for smaller parts made in the same or other departments.

Recover and reclaim used cutting oils, lubricants, surplus paints and spray finishes.

Sort sweepings and miscellaneous waste to recover scrap values.

5 Constant reminders in the form of posters, illustrations of right and wrong methods, pay envelope enclosures, house organ publicity, etc., are potent aids to the conservation program.

6 Release for scrap, obsolete engravings, electrotypes, and standing types for catalogs, forms and advertising material.

7 Inspect all refuse to detect avoidable waste and excessive rejections. Educate production executives to correct such conditions at the source.

8 For information and assistance on special phases of conservation and salvage communicate with Industrial Salvage Section, Conservation Division, War Production Board, 9th Floor, Washington Gas Light Building, Washington, D. C., or with nearest regional office

The metallurgical experience of our technical staff is available to aid you in these and other technical phases of metal salvage.

KEEP SCRAP MOVING INTO WAR PRODUCTION!

THE INTERNATIONAL NICKEL COMPANY, INC. 67 WALL STREET NEW YORK, N. Y.

HIGHLIGHTING

this issue of STEEL

CONTRACTS War manufacturers are becoming increasingly impatient over the inequalities of the contract renegotiation law (p. 21). Many believe that it should recognize losses as well as profits. . . Treasury Department has explained its rules for the return of excessive profits.

TAXES Expenditures are outracing taxes at an amazing rate, according to E. L. Shaner, STEEL's editor-in-chief, (p. 21). Why is Congress so blind to the revenue aspects of the tax problem?

WASHINGTON The CIO has moved (p. 32) into the quarters formerly occupied by the Grand Old Party and believe the union has arrived at the stage of labor "statesmanship". Labor, in the belief of many people, having already taken over the government, now is in control of a former stronghold of political opposition. . . A major reorganization of the War Production Board brings several top-flight executives into the war production program (p. 37). . . Industrial executives (p. 33) are advised to beat the government to the draw and publicize their own salaries—along with their income taxes, charitable donations and other contributions. . .

CONSERVATION Steel can be saved by adopting new processes, says Willard F. Rockwell (p. 49), whose company is proving the statement in the manufacture of differential pinions. . . Practically unheralded are the achievements of the packaging industry, which, finding difficulty in converting to war production, nevertheless has aided the program by devising new types on containers using less critical materials. . . F. W. Mettler shows how advances in welding design have made it possible to cut the weight of structural steel required for buildings by 40 per cent (p. 77). Additional material can be saved by taking full advantage of continuity in design made possible by welded rigid frame constructions.

LABOR Most of the basic steel producing companies have been ordered by the National War Labor Board to "show cause" why they should not accept the provisions handed down by the board in cases involving the "Little Steel" companies and United States Steel Corp. subsidiaries (p. 38). An unprecedented action, the ruling virtually commands all steel producers to grant the closed shop and checkoff system as well as retroactive wage increases to last February. . . More favorable news on the labor front is found in the number of valuable suggestions from employes (p. 44) for speeding up production of war materials. Particularly impressive is the attempt of a propeller manufacturer's employes to utilize their machine tools to the fullest advantage. Also encouraging is the response of metalworking companies' employes to the War Bond campaign (p. 51). Many have all workers subscribed to the drive and have been awarded the Treasury "T". . . Ray E. Ellis tells how General Electric's apprentice training program produces fully qualified workmen (p. 56). Three new motion picture films produced by Aluminum Co. of America to assist in training workers (p. 60).

PRODUCTION F. G. Gepfert describes a drill that speeds production by allowing machining of fully hardened parts (p. 61); salvages parts when an error is discovered after hardening; eliminates distortion resulting from heat treating parts after machining. . . A really practicable suggestion system (p. 59) gets results by enlisting workers' knowledge of the job. Some ideas increase output sharply. . . United States Steel Corp. directors meet in Chicago to inspect new steelmaking facilities (p. 25).

SALVAGE Scrap needs for the remainder of the year can be met if the current WPB campaigns reach their goal (p. 25). War Materials Inc. will swing into full operation within a few days.

MAINTENANCE Maintenance of industrial trucks is vital to war effort as they furnish one of the most important links in the materials handling system. F. L. Sahlmann outlines a program (p. 80) that assures effective work.

TECHNICAL Paul J. McKimm concludes his series on the manufacture of high-quality low-cost steel by discussing the heterogeneity of ingots (p. 68). . . A highly successful setup for removing heat-treat scale from pipe is described (p. 64). . .Twelve diagrams show steps in connection with procedure given (p. 74) for wet or dry hand grinding of carbide tools. . . Details are presented (p. 72) for making an inexpensive box that affords safe breakage of test samples.

"Send us more scrap— and, we'll make more steel"

"We steelmakers can make more steel, *if you'll send us more scrap!* We are appealing to you because we need the help of American industry more than ever before.

"Do you know there is no longer such a thing as a scrap stock pile at the mill? We are charging scrap as it comes in from day to day. If scrap should suddenly stop reaching us we would be down to 50% of capacity within 24 hours.

"It's so easy to look outside of industry at all the scrap that could be gathered—old autombiles and the like. But, do you know that there is only about 1,000 pounds of scrap in an old jitney, and that only one of the Inland banks of furnaces melts 9,000,000 pounds of scrap in 24 hours? That's 9,000 old autos a day—and they are just not coming in anywhere near that fast.

"That is why we are looking to industry to send us more scrap. Forget you've ever put on a drive. Start a new one now! Send to us, as soon as possible, that old building steel, unusable machinery, dead stores, and obsolete dies, jigs and fixtures.

"America is waiting for steel—our fighting men are waiting for ships, tanks, guns, shells.

"We steelmakers will make more steel for victory, when you send us more scrap."

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STEEL
September 28, 1942

Something Wrong Somewhere

In the current fiscal year ending next June 30, the federal government probably will spend 80 billion dollars. The 1942 tax bill, now being considered by the Senate Finance Committee, will yield about 25 billion dollars.

One does not need to be a financial expert to realize that the proposed income from taxes is woefully inadequate in relation to expenditures. Consequently one wonders why Congress is so blind to the revenue aspects of the tax problem. Judging from most of the discussions to date, the legislative and executive branches of the government have been more concerned about the punitive and reform objectives of taxation than about the number of dollars it will yield.

Proof of this is found in the cold, uncomfortable fact that the House version of the bill already has invoked the law of diminishing returns. Months before the 1942 bill will be enacted, the proposed levy upon corporations was so high that certain costs of manufacturing were destined to be borne more heavily by the government through tax losses than by the manufacturer in direct payments.

Consider the 5 per cent wage increase granted employes in "Little Steel." Under the provisions of the House bill, for every dollar of wage increase, the government would lose 90 cents in taxes from the corporation employer and would recover 15 cents in increased taxes from the employe recipients of the raise. Thus for every dollar of industrial wage increases, Uncle Sam would suffer a net loss of 75 cents in taxes. The employer would pay only 10 cents out of every dollar of increased wages.

Clearly something is radically wrong. If taxes are so high that a company cannot absorb ordinary manufacturing costs, then the rate is defeating the purpose of taxation. On the other hand, if wage increases are so liberal or so frequent that they are a subsidy to labor rather than a legitimate item of manufacturing cost, then there is something haywire in the national wage policy.

E. L. Shaner

Editor-in-Chief

War Contract Revisions "Should Work Both Ways"

Present system means hardship for companies incurring loss or abnormally low profit. Senate tax chairman proposes 5 per cent on ordinary contracts, 1 per cent for facilities financed by government

RENEGOTIATION of war contracts should work both ways—to drain off excessive profits and to recompense manufacturers who make an abnormally low profit or incur a loss. This was the consensus expressed at the annual meeting of the Controllers' Institute of America in Chicago last week.

The law authorizing various military procurement officers to renegotiate war contracts has been bitterly criticized by many war manufacturers who found themselves whip-sawed between that act and the federal revenue acts.

That the present statutes are working hardships on some manufacturers who are going all-out for war production appears indisputable.

The law governing renegotiation of contracts last week was described as one of the most far-reaching, unnecessary and dangerous pieces of legislation that has been enacted by the Congress by Roscoe Seybold, vice president and comptroller, Westinghouse Electric & Mfg. Co. before the controllers' meeting.

Asserting that sections of the act refer to renegotiation when excessive profits have been realized or are likely to be realized, Mr. Seybold said that the question has been raised as to whether or not consideration should be given to requests for renegotiation where profits are too low. This apparently has not yet occurred to congressmen or other government officials.

Senate Committee's Ideas

Washington officials last week made several attempts to patch up what is obviously an unsatisfactory situation.

The Senate Finance Committee placed the problem in the hands of a seven-member subcommittee after Chairman Walter F. George, Georgia, had moved to limit war profits to 5 per cent on ordinary contracts and 1 per cent where facilities were financed by the government. His proposal would impose a 100 per cent tax on all profits exceeding 5 per cent after payment of all other taxes, and on all profits exceeding 1 per cent on contracts executed in plants financed by the government.

The Bureau of Internal Revenue issued a formula (page 23) for the repayment of excessive profits to the government.

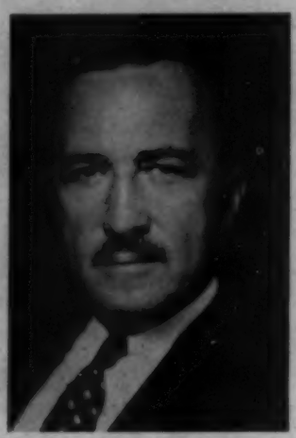
Neither proposal grants any relief for the manufacturer who makes an abnormally low profit or who incurs a loss.

Considering the stringent terms and conditions under which manufacturers are expected to accept contracts, the freedom with which the government can change manufacturing conditions, wage rates, materials prices, and other costs, there is a threatening probability that the contract may result in a loss or an extremely low profit, Mr. Seybold said.

"If we must have such a law, renegotiation should recognize the advisability of increasing profits to the manufacturer as well as returning excess profits to the government."

The War Department appears to contemplate the exercise of renegotiation powers by each contracting officer, said Mr. Seybold. Chances are that in many cases the person to whom this authority has been delegated will not be competent to determine the effect of his determination on the corporation's financial structure.

It would be unfair to consider the machine tool industry, which after the emergency may be faced with a depression, in the same profit class with an industry which will be little affected by termination of the war production program.



William P. Witherow

Proposed "Atlantic Charter for Business" . . . "freedom from inflation; freedom from unwise taxes; freedom from strikes and freedom for management to run its own affairs, as far as is possible with war-time restrictions"

Roscoe Seybold

Renegotiation law . . . "dangerous and unnecessary"

Suggests More Equitable Tax

The law providing for renegotiation of war contracts is to remain in effect for the duration of the war and for three years thereafter, Mr. Seybold pointed out.

He questioned the treatment of excess profit renegotiation in federal income and excess profits tax returns. Acknowledging that the Bureau of Internal Revenue had ruled that it would give full credit for these renegotiated profits, in a letter to Chairman Carl Vinson of the House Naval Affairs Committee, Mr. Seybold said the ruling may be limited in its application and does not cover all phases of the problem.

"Up to the present time," he said, "we are not aware that any ruling has been published with respect to the tax effect on renegotiation of subcontracts."

Elimination of excess profits is amply cared for in the proposed corporation tax bill now being considered by Congress, Mr. Seybold declared.

"I am entirely in sympathy with a program of taxation that returns to the Treasury all possible funds for financing the war problem, and I believe that all industrial corporations realize not only the necessity but the desirability of that sort of program. But the return of excess profits to the government can be accomplished more equitably and more efficiently by means of a properly developed tax program than through the administration of the renegotiation law."

William P. Witherow, president of the National Association of Manufacturers, and head of Blaw-Knox Co., Pittsburgh,

proposed to the institute members an "Atlantic Charter for Business."

Mr. Witherow asserted the four freedoms for business well could be "freedom from inflation," "freedom from unwise taxes" that will deplete the essential resources of the country, "freedom from strikes," and "freedom for management" to run its own affairs as far as is compatible with wartime restrictions.

Two realities of war, said Mr. Witherow, are the mammoth problem of paying for it and the treacherous threat of inflation.

"These," he said, "cannot be put off until the war is won. They are part and parcel of how to win the war."

The tax program, he added, must pay for the war and "sop excess purchasing power to ward off and stop inflation cold.

Much could be done to eliminate delays if the government would in some way correlate its efforts on taxes, prices, wages and the renegotiation of contracts. This, he said, would free management from many distractions and expedite war production.

Thomas H. Sanders, chief, WPB Cost Analysis Section, defended renegotiation of contracts before the controllers. He denied that such renegotiation had delayed war production.

He said the WPB will permit war contractors to charge part of their normal advertising expenditures against war work.

Treasury Establishes Rules for Return of Excess War Profits

COMPANIES returning money to the government as a result of renegotiation of war contracts should refund only the amount of profits above federal income and excess profits taxes paid or assessed on the sum involved, according to a Bureau of Internal Revenue opinion handed down last week.

This applies in cases where the renegotiating agreement provides for reduced contract prices to be retroactively applied to prior taxable years for which returns already have been filed and income and excess profits taxes already paid or assessed.

The bureau stated that in such cases no such refund or abatement of these taxes should be made since the taxes should be considered as a recapture of a portion of the excessive profits and as such offset against the total excessive profits. The repayment, the bureau said, should not be allowed as a deduction in the income and excess profits tax returns of the taxpayer for any taxable year.

The bureau also outlined procedure in cases where the renegotiating agreement becomes effective before tax returns have been filed or taxes paid or assessed. In this instance the gross income to be reported by the corporation should not include the excessive profits so rebated and no tax attributable to excessive profits thus will be assessed or paid.

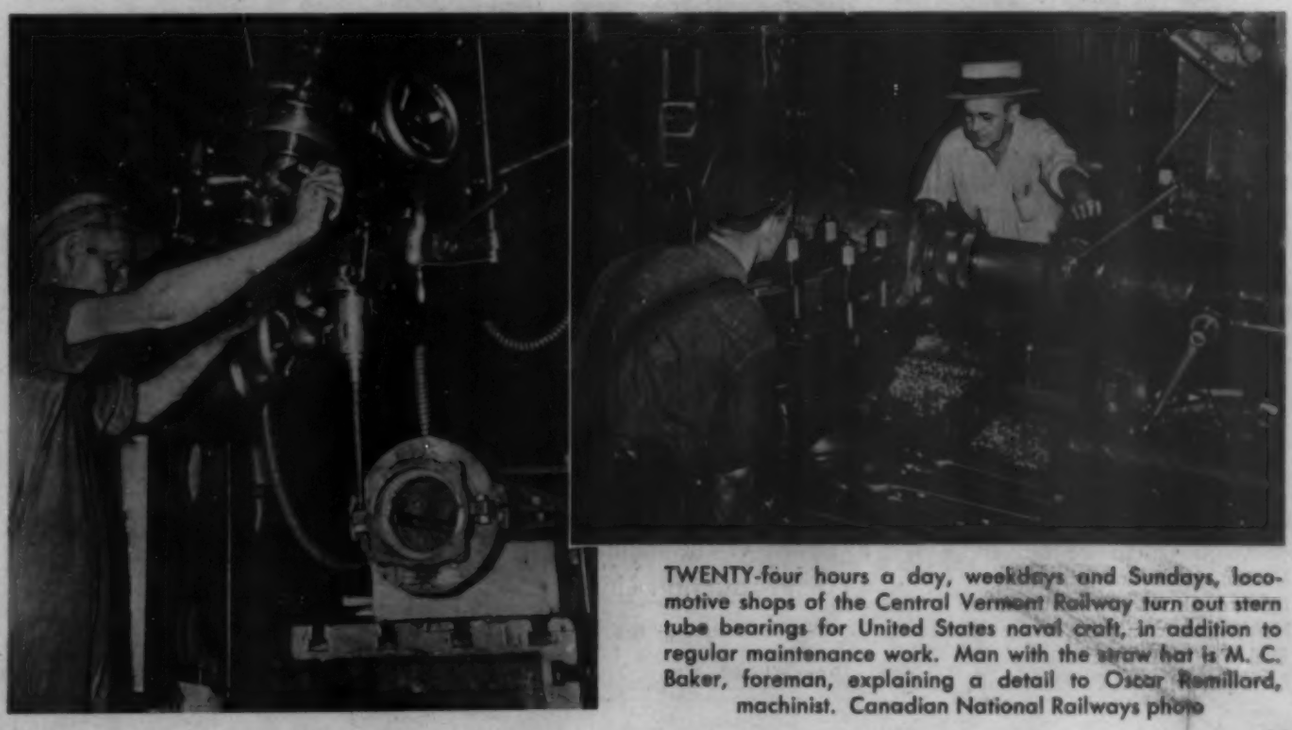
Same procedure should rule in cases involving a cost-plus-fixed-fee contract where an item for which the taxpayer has been reimbursed is disallowed as an item of cost and the taxpayer is required to repay to the United States the amount disallowed.

A "statement of policy" gave the following applications:

Example: The "M" Corp. filed a return for the calendar year 1941 on March 15, 1942, reporting therein an amount of $1,000,000, which was subsequently in the year 1942 held by one of the designated renegotiating agencies to be excessive profits realized in performance of a contract, on which excessive profits income and excess profits taxes aggregating $400,000 were paid. The $400,000 taxes should not be refunded and the remainder of the excessive profits, or $600,000, should be repaid by the corporation to the government.

The $600,000 repaid to the government

VERMONT RAILROAD MACHINISTS MAKE PARTS FOR NAVAL VESSELS



TWENTY-four hours a day, weekdays and Sundays, locomotive shops of the Central Vermont Railway turn out stern tube bearings for United States naval craft, in addition to regular maintenance work. Man with the straw hat is M. C. Baker, foreman, explaining a detail to Oscar Remillard, machinist. Canadian National Railways photo

will not constitute an allowable deduction from gross income for any taxable year. This produces the correct result. Excessive profits, before federal taxes, of $1,000,000 would have been recaptured by the government, $400,000 through the medium of taxes and $600,000 by direct repayment to the government, with no aftermath affecting federal taxes.

To hold otherwise, for instance, to hold that the $1,000,000 should be repaid to the government and allow such repayment as a deduction for income tax purposes for the year 1942, when the effective rate of tax, for example, is 75 per cent, would produce the following incorrect result: The tax benefit in 1942 would be $750,000. The taxpayer would have paid $1,400,000 to the government and derived a tax benefit of $750,000.

The taxpayer, therefore, would have paid only $650,000 net to the government, whereas the excessive profits admittedly were $1,000,000. Different results would be obtained in other cases depending upon the factors of income and effective rates of taxes being different from those in this example.

Another example: The "X" Corp. filed a return for the calendar year 1942 on March 15, 1943. In February, 1943, it was determined that the taxpayer had realized during 1942 excessive profits in the amount of $1,000,000, and the parties agree that during 1943 repayment of such excessive profits will be made to the government in designated amounts per month until the entire amount of the $1,000,000 excessive profits is repaid.

The gross income to be reported by the corporation in its return for 1942 should not include the $1,000,000, and no tax attributable to excessive profits will thus be assessed or paid. No deduction from gross income will be allowed for any year for the amount of the excessive profits excluded from gross income and repaid to the government.

NEWS NOTES

British Air Mission Inspects Detroit Plants

Key figures in British aircraft production last week visited the Packard and Ford marine and aircraft engine plants in the Detroit area. The party, numbering a dozen, recently arrived from England and is starting a tour of American war production plants contributing to the allied air effort. Purpose of the trip is a study and exchange of ideas for aircraft production betterment.

The visitors are sponsored by the British Ministry of Aircraft Production as a mission to the United States. Besides Ministry executives, they include production heads of British aircraft plants.

Accompanying the delegation was Merrill C. Meigs, chief of WPB's aircraft section. With him were Alex Dunbar, comptroller general, Ministry of Aircraft Production; D. W. Mitchell, Ministry of Aircraft Production (secretary to the mission) and Sir Charles Bruce-Gardner, chairman of the Society of British Aircraft Constructors.

British manufacturing representatives were: B. W. A. Dickson, director of Vickers-Armstrong (Spitfire fighters); S. D. Davies, production manager of A. V. Rowe & Co. (Lancaster bombers); J. D. North, joint managing director Boulton-Paul Co. & Boulton Aircraft Co. (Defiant planes); W. C. Devereaux, chairman and managing director, High Alloys Ltd.; and A. R. Smith, managing director, Ford Motor Co. of England.

Structural Institute Announces Design Contest

American Institute of Steel Construction, New York, last week announced another annual bridge design competition, open to bona fide registered students of structural engineering and architecture in recognized technical schools of the United States and possessions. It offers three cash prizes of $200, $100 and $50, respectively, for the designs placed first, second and third. Certificates, signed by the Jury of Award and Officers of the Institute, will be awarded to the prize winners and to those whose designs are given honorable mention.

Subject of the design is a steel grade separation carrying a highway over the four-track main line of a railway, a navigable canal, and a dual four-lane highway, to which there shall be one-way connection with the overhead crossing.

"Train Women Immediately For Production Lines"

War industries in the Detroit district were urged last week by the WPB to take immediate preparatory steps toward using women workers on production lines.

In a letter to manufacturers' associations, D. J. Hutchins, WPB Detroit regional chief, emphasized that a definite shortage of manpower in the district will appear within a few weeks and that the available supply of women must be utilized then.

Recent registration for women war workers in Wayne, Oakland, Macomb and Washtenaw counties determined that 180,000 are willing to accept industrial work. Of this number, 53,000 registrants indicated they had previous factory experience.

Steps should be taken immediately by the various war plants to analyze jobs now done by men which could be readily filled by women," said Mr. Hutchins. "Under the present priorities system there is a method of providing means to set up necessary facilities for women workers in plants, such as restrooms, first aid rooms, etc."

Offers Foremen Training in "Breaking in" New Workers

PITTSURGH

While manpower shortage is not especially serious now in this district, it will become an increasingly difficult problem within the next year, according to C. S. Coler, director of WPB's Training Within Industry program, here.

About 50,000 additional workers will be needed in the next 12 months to replace those taken by the armed forces.

The Training Within Industry division has evolved a highly successful 10-hour course to show supervisors how to break in new men, a sample of which was given to the Pittsburgh Foundrymen's Association by Mr. Coler and his associates. The division has a large number of skilled teachers which it sends to the plants of interested concerns. These men train the foremen in the art of breaking in a new man on any job, regardless of its type or how complicated it may be, through a breakdown of the job and through a technique of instruction which uses the simplest possible approach. The training is free to all plants.

MEETING

American Gear Manufacturers Association: Twenty-fifth semiannual meeting will be held at Skytop Lodge, Skytop, Pa., Oct. 15-17, and essentially will be devoted to members' part in the war effort. Association announces its headquarters have been moved from Wilkinsburg, Pa., to 301-302 Empire building, Pittsburgh.

Directors Meet in Chicago, Inspect New Facilities for War Work

CHICAGO

BECAUSE of the importance of this Midwest center in the United States Steel Corp.'s war production effort, the board of directors met here last Wednesday—the first meeting of directors in the history of the corporation to be conducted outside New York. It was devoted mainly to affairs of the Chicago district, and provided an opportunity for the directors to inspect facilities, principally in South Chicago and Gary. Last prior inspection was two years ago, when directors made a swing around the country to visit the various plants.

It is understood the Chicago meeting marked the beginning of a more or less regular cycle of meetings away from New York. No definite plan has been established, but cities will include major steelmaking centers, such as Pittsburgh, Birmingham and Chicago.

Directors attending the meeting were: Irving S. Olds, chairman; Benjamin F. Fairless, president; Enders M. Voorhees, chairman of the finance committee; William A. Irvin, former president; William J. Filbert, retired chairman of the finance committee; Sewell L. Avery, chairman, United States Gypsum Co., Chicago; Philip R. Clarke, president, National City Bank, Chicago; Leon Fraser, president, First National Bank, New York; Thomas W. Lamont, partner, J. P. Morgan & Co., New York; George A. Sloan, president, Nutrition Foundation Inc., New York; and Robert C. Stanley, chairman and president, International Nickel Co. Inc., New York.

Also attending were: William Averell Brown, secretary, United States Steel Corp., New York; J. Carlisle MacDonald, assistant to chairman, New York; John H. Osmers, general assistant to chairman, New York; and B. H. Lawrence, vice president, United States Steel Corp. of Delaware, Pittsburgh.

District's Program Outlined

At a press conference Mr. Olds said:

"Today every ton of steel produced by United States Steel in the Chicago district is going into America's war effort. Through loyal and effective cooperation between employes and management, steel is being turned out by our plants in this area in continually greater quantities for ships, tanks, guns, planes, and other war uses. Improvements and additions to existing plant facilities are rapidly being completed, and will soon result in a larger flow of steel and steel products to feed America's war machine.

"A tank armor plate plant is under construction by Carnegie-Illinois Steel Corp. in the Chicago district, for account of the United States Army. This plant will be in operation early in 1943, and will supply shaped tank armor plate ready for speedy assembly on tanks to be erected at Midwestern tank arsenals.

"Tubular Alloy Steel Corp., a new subsidiary, has acquired the plant of National Tube Co. at Gary. This new company will produce alloy and stainless tubing for aircraft structures, motor parts, bearings, tank tractor tubing, and oil refinery tubing. The work of installing machinery and equipment is now in progress. Tube reducing machines, key equipment for the production of aircraft tubing, have been installed and immediately placed in operation without waiting for the installation of the remaining machines.

"Last year American Steel & Wire Co. announced plans for rehabilitation and expansion of its facilities in this district, including a new coarse rod mill and a new mill for the manufacture of merchant products at Joliet, and various improvements in its facilities at Waukegan are already in operation. Others at Joliet will be in operation by the first of the year. It is expected that the project will be completed and producing to aid the war effort during the first half of 1943.

Expansion Outlay $67,000,000

"Carnegie-Illinois in addition to constructing the armor plate plant, has been active in expanding its facilities in the Chicago area for steel production. This program involves an expenditure of more than $67,000,000. Major items include projects at the South Chicago steel works, Gary steel works, and Gary sheet and tin mills.

"At the Gary Works, the work of rebuilding 12 soaking pits is practically completed. One coke oven battery was rebuilt and resumed operations last month. Another which is being rebuilt will resume operations about Dec. 1. A new battery of coke ovens, being built for account of the Defense Plant Corp., will be completed early next year. A program for increasing facilities to provide slabs for the new armor plant is well advanced.

"The South Chicago works of Carnegie-Illinois is United States Steel's manufacturing center for electric furnace steels, which are used extensively in aircraft construction. Existing electric furnace facilities are being increased by the installation of an additional furnace and additional finishing facilities. Two new electric furnaces were placed in operation in 1941.

"At Gary sheet and tin mills, the installation of additional electrolytic tin-

(*Please turn to Page* 105)

United States Steel Corp. directors in Chicago: Left to right, Philip R. Clarke, Robert C. Stanley, George A. Sloan, William A. Irvin, Benjamin F. Fairless, president, Irving S. Olds, chairman, Enders M. Voorhees, chairman of finance committee, Thomas W. Lamont, William J. Filbert, Leon Fraser, Sewell L. Avery

Sustained Steel Output Depends On Success of Scrap Campaigns

NEED for scrap in the remainder of the year will be met if drives fostered by the industrial and general salvage sections of WPB are successful, according to R. D. McGiffert, assistant chief, Industrial Salvage Section, Philadelphia district.

Speaking before the Association of Iron & Steel Engineers at their annual technical session in Pittsburgh last week, Mr. McGiffert indicated the farm and home drives are expected to supply 4,000,000 tons during the last half of the year; the industrial drive 3,000,000 tons, and the active market 10,000,000 tons. He said these were established by a Gallup poll, and are believed to be reasonably accurate. The big job remains that of bringing the existing material to market.

The active market scrap is moving well and according to schedule. The general salvage section is organizing drives for home and farm scrap in all sections of the country, and the industrial salvage section, with the aid of the newly organized War Materials Inc., and the Special Projects section of the Bureau of Industrial Conservation, expects to reach its quota on industrial material.

The industrial drive is centered in 13 regional offices, each of which is directed by a regional chief and is staffed with field representatives. Through a newly evolved plan, the steel industry will help this organization by detailing 2000 salesmen from the producers and 1000 additional from warehouses to assist field men in tracking down industrial scrap.

Community Organization

Most communities have already been organized to assist the drive. A committee of industrialists is set up, this committee to contact all plants and have each plant establish a salvage chairman, with authority to condemn material and clear it out. The formula which should be applied is the usefulness of material. Any item which has not been used for three months, or which will not be used in the next three months, should either be sold to someone who can use it immediately or scrapped.

It is expected that a concentrated drive will shortly be launched in Philadelphia with the aid of the steel salesmen. The Industrial Salvage Section is confident that all the industrial scrap in the city can be cleaned up in six weeks to two months. If the program appears to be successful, similar methods will be used in drives in other industrial centers.

Aid will be given this program by the Special Projects Section, in getting out unusual scrap which does not ordinarily occur in industrial plants, and by War Materials Inc., for scrap which cannot be salvaged under the ceiling price. The co-operation of these agencies will facilitate the movement of almost every type of industrial scrap, and, with the co-operation of industry, should guarantee an adequate supply to keep the furnace at capacity.

Organization of WMI Is Nearly Completed

War Materials Inc., still struggling through its organizational difficulties, expects to swing into full operations about Oct. 1. Already some scrap is being brought out through this organization, but the sustained action drive will begin about that time.

Currently the energies of many of its employes are being directed to the setting up of competent personnel, establishing methods and procedure, and mapping the program to be established. Blanks have been distributed to a large segment of the scrap trade on which they are to report the existence of material which requires the services of WMI before it can be brought to market.

While much of the future activity of the company will revolve about these reports and their contents, additional programs will be established whereby obvious sources of scrap, such as slag dumps, mines and abandoned wells, will be systematically investigated.

Salvage Committee Suggests Scrap Campaign Organization

Suggestions for organizing scrap collection campaigns in industrial plants were offered last week by the American Industries Salvage Committee, New York, representing members of the iron and steel industries.

Among suggestions offered were the following:

1. Head up the campaign by appointing an able executive of the company, armed with authority to act.

2. Use posters, illustrations, pay-envelop stuffers, and all other publicity means to enlist all employes in scrap campaign.

3. Comb plant and yards for dormant scrap and unusable and abandoned equipment.

4. Survey all plant equipment, particu-

Town donates jail to metal drive: Citizens of Old Ripley, Ill., turned out—all 115 of them—to see the metal parts of their jail, long unused, in a parade down Main street to the scrap pile. NEA photo

larly idle, standing or discarded machines.

5. Classify and segregate scrap and supervise its handling.

6. Make each foreman responsible for preventing spoilage and waste in his department.

7. Report promptly equipment which is obsolete. If equipment has not been used in three months, and it can't be proved that it will be used in the next three, turn it over where it can be used . . . or scrap it.

8. Salvage usable parts from equipment marked for scrapping.

9. Speed return of scrap to mills and refineries through existing channels. Report regularly on collections of scrap to the Industrial Salvage Committee set up by the War Production Board in your community.

10. Enforce monthly re-checks in every department to find scrap material previously overlooked.

Scrap Consumption Shows Slight Increase for August

Consumption of iron and steel scrap in August is estimated by the Institute of Scrap Iron and Steel Inc., Washington, at 4,645,000 gross tons, which is a slight increase over the 4,600,000 tons for July and 4,518,000 tons for August, 1941.

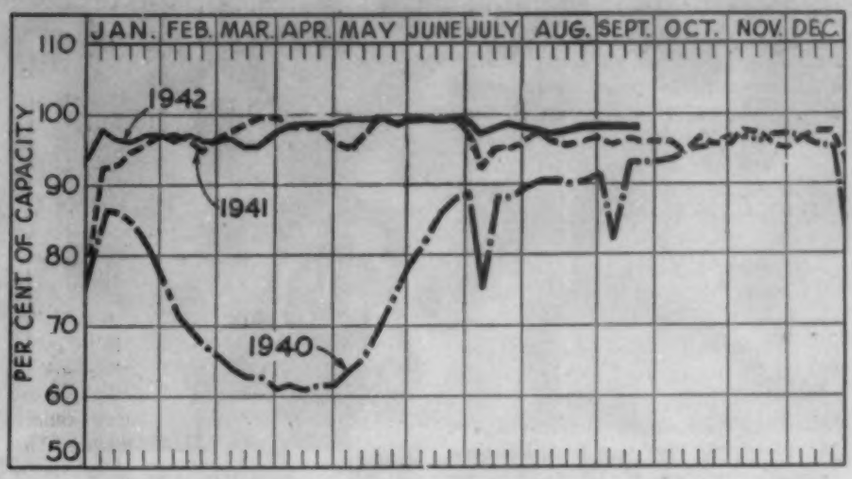
In eight months consumption of scrap is placed by the Scrap Institute at 37,088,000 gross tons, which compares with 35,466,000 tons in the corresponding period of 1941 and 25,706,000 tons in the like months of 1940.

These consumption figures include both home scrap, which is produced within steelmaking plants and foundries, and purchased scrap, the former being about 55 per cent and the latter 45 per cent.

Steel & Wire Plants Set 46 New Records in August

American Steel & Wire Co. plants set 46 new production records in August, which brought total since Pearl Harbor to 569. The Worcester, Mass., and Joliet, Ill. works each contributed nine new marks; Donora, Pa., five; Cuyahoga Works, Cleveland, and New Haven, Conn., and Trenton, N. J., works four each. American works, Cleveland, and Waukegan, Ill., plant each made three new high. Consolidated Works, Cleveland, broke two records, and Central furnaces, Cleveland, Allentown, Pa., works and Duluth plants each contributed one new high.

International Business Machines Corp., Endicott, N. Y., recently dedicated its second war munitions plant built there within a year.



STEEL . . . . . STEADY

PRODUCTION of open-hearth, bessemer and electric furnace ingots last week held at 98 per cent, four districts making small gains and three declining, with five at unchanged rates. A year ago the rate was 96 per cent; two years ago it was 93 per cent, both based on capacity as of those dates.

Chicago—Steady at 102½ per cent. The only facilities not engaged are down for repairs. Three blast furnaces are being relined and 35 are active.

St. Louis—One open hearth taken out for repairs reduced production 3 points to 92 per cent.

Detroit—With only one open hearth idle, production rose 6 points to 95 per cent.

Cleveland—Addition of an open hearth by one interest and a slight decrease by another caused production to advance ½-point to 93½ per cent.

Pittsburgh—Advanced 1 point to 96 per cent.

Wheeling—Declined 4 points to 80½ per cent.

Cincinnati—Completion of open-hearth repairs by one interest lifted the rate 9 points to 92 per cent

Buffalo—Unchanged at 90½ per cent, only necessity for furnace repairs preventing a higher rate.

Central eastern seaboard—Slight adjustment of units caused a drop of ½-point to 96 per cent.

Youngstown, O.—Held at 95 per cent with 75 open hearths and three bessemers active, despite a scrap and labor shortage. Schedule for this week is at the same rate. Another blast furnace will be blown in this week.

New England — All open hearths are in operation and the rate is 100 per cent for the second week.

Birmingham, Ala. — Continued at 95 per cent with 23 open hearth furnaces in service.

District Steel Rates

Percentage of Ingot Capacity Engaged in Leading Districts

	Week ended Sept. 26	Change	Same week 1941	Same week 1940
Pittsburgh	96	+ 1	98	88.5
Chicago	102.5	None	101	96
Eastern Pa.	96	— 0.5	95	92
Youngstown	95	None	98	84
Wheeling	80.5	— 4	91	97
Cleveland	93.5	+ 0.5	95.5	86
Buffalo	90.5	None	90.5	97
Birmingham	95	None	95	97
New England	100	None	90	85
Cincinnati	92	+ 9	83	88
St. Louis	92	— 3	91	80
Detroit	95	+ 6	87	94
Average	98	None	*96	*93

*Computed on basis of steelmaking capacity as of those dates.

Republic Exceeds 1940 Ingot Record at Mid-September

In slightly more than nine and a half months of 1942 steel ingot production of Republic Steel Corp. exceeded total output for the entire year 1940, more than 6,100,000 tons, which was a record for Republic up to that time. This mark was passed at 3 o'clock in the afternoon of Sept. 20.

If raw material shortages do not become more serious company officials believe the ingot total for 1942 will substantially exceed the all-time record set in 1941.

MEN of INDUSTRY

FRANK EDWARD FLYNN, district manager, Republic Steel Corp., Warren, O., has been elected president for 1943 of the Association of Iron and Steel Engineers. Other new officers of the association are first vice president, **C. L. McGranahan,** assistant general superintendent, Pittsburgh Works, Jones & Laughlin Steel Corp.; second vice president, **J. L. Miller,** assistant combustion engineer, Republic Steel Corp., Cleveland; treasurer, **J. S. Murray,** electrical engineer, Follansbee Steel Corp., Follansbee, W. Va.; secretary, **F. H. Dyke,** superintendent, blooming bar and hot strip mills, Wheeling Steel Corp., Steubenville, O. Mr. Flynn, the president-elect, has been associated successively with Superior Steel Co., Phillips Sheet & Tinplate Co., later Weirton Steel Co., and Trumbull Steel Co. at Warren, where he became assistant vice president in charge of operations. When Trumbull was taken over by Republic, he was appointed assistant district manager, Warren-Niles district, and was made manager in 1935.

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Bert Dingley, former executive vice president, Marmon-Herrington Co., Indianapolis, Ind., has been elected president in a recent reorganization of company's management authorized by its directors. Vice presidents elected to assist him include **R. C. Wallace,** in charge of engineering; **Seth Klein,** in charge of production; **C. Alfred Campbell,** in charge of public relations; and **George E. Reynolds,** in charge of company's eastern district. Elected to replace **D. I. Glossbrenner,** secretary and treasurer who has resigned to enter the military service, are **William P. Nottingham,** secretary, and **Harold DeBaun,** treasurer. **John J. Klein,** assistant to the chairman, has been elected assistant secretary, and **L. M. O'Connor,** assistant treasurer. **A. W. Herrington** continues as active chairman of the board.

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D. F. Woods, for 17 years general agent, Chicago & Eastern Illinois railroad, Pittsburgh, has been appointed to a new position as general freight agent at Chicago. **G. T. Whitmore,** assistant general agent, Detroit, will succeed Mr. Woods at Pittsburgh. **Martin C. Wright** of Chicago, will succeed Mr. Whitmore.

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A. W. Zimmer has rejoined Reo Motors Inc., Lansing, Mich., as works manager after an absence of two years during which he was associated with Allison Engineering Co., Indianapolis, Ind.

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Walter J. Kelly, acting manager of industrial relations, Tennessee Coal, Iron & Railroad Co., Birmingham, Ala., and **John H. Williamson,** acting assistant manager of industrial relations for the company, have been appointed manager and assistant manager, respectively, of that department. **James F. Vance,** former manager, is permanently retired.

Frank Edward Flynn

A. W. Herrington

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Elbert E. Husted has been elected president, Titeflex Metal Hose Co., Newark, N. J., succeeding the late **C. W. Fletcher.** He joined the Titeflex organization in 1924 and represented the firm in a sales capacity until 1930, when he was made sales manager. He was made vice president in 1936, and general manager in 1938.

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Marvin J. Udy, vice president in charge of research and technology, Chromium Mining & Smelting Corp. Ltd., Montreal, has been made a member of corporation's board of directors. **H. V. Glunz,** formerly superintendent, has been made vice president in charge of production.

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Leonard W. Reeves, assistant to acting manager of main plant, Thompson Products Inc., Cleveland, has been named vice president and general manager, Toledo Steel Products Co., Toledo, O. subsidiary. **John M. Kerwin,** general superintendent, Clarkwood Road plant, Cleveland, has been promoted to factory manager, **Andrew Karabinus,** divisional superintendent, succeeds Mr. Kerwin.

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William T. Hedlund, director, Elastic Stop Nut Corp., Union, N. J., has been elected president. He was formerly vice president in charge of engineering, Electrolux Corp., New York, and is widely known as a patent authority.

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Reginald Everett Gillmor, president, Sperry Gyroscope Co., Brooklyn, N. Y., has been elected chairman of the executive committee, Fairchild Engine & Airplane Corp., New York, of which he has been a director since 1941.

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Dr. C. F. Burgess, inventor of the standard Burgess Battery, has been awarded the Edward Goodrich Acheson Medal and $1000 prize by the Electrochemical Society. Medal and prize represent the highest award in that field.

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A. G. York, formerly assistant to the president and managing director, Forged Steel Fittings Division, Watson-Stillman Co., Roselle, N. J., has been named vice president in charge of sales for the entire company. He fills the vacancy created by the resignation of **J. C. Grindley.** Other appointments include **R. W. Dinzl,** vice president in charge of engineering; **F. H. Stillman,** assistant to the president and assistant secretary; and **William Woidt,** assistant secretary.

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Walter L. Maxson has been appointed manager, crushing cement and mining machinery division, Allis-Chalmers Mfg. Co., Milwaukee, succeeding **Herman Schifflin** who is retiring. Before entering the employment of Allis-Chalmers in 1927, Mr. Maxson was a professor of metallurgy at Colorado School of Mines, and served as consulting engineer in mining and metallurgy.

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C. B. Carr will continue as manager of the Cleveland district sales staff of Gisholt Machine Co., Madison, Wis., with headquarters at 902 N. B. C. building, Cleveland, assisted by **Ray Hering,** and by **R. J. Miller Jr.,** who has been transferred from the plant in Madison. In the issue of Sept. 21, it was reported that **Roy Hunter,** who died Sept. 13, was Gisholt's district manager in the

Cleveland territory, whereas he was direct sales representative in northern Ohio and western Pennsylvania.

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Loren T. Robinson, vice-president, Campbell-Ewald Co., Detroit automobile advertising agency, has been commissioned a major in the Army Air Corps. He joined the agency 20 years ago.

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Herman E. Bakken, assistant director of research, Aluminum Research Laboratories of Aluminum Co. of America, New Kensington, Pa., has been made associate director by **Dr. Francis C. Frary,** director of research. **J. D. Edwards** continues as associate director. Other promotions include **E. T. Dix Jr.,** chief metallurgist, and **R. L. Templin,** chief engineer of tests, who have been appointed assistant directors. Mr. Bakken entered the employ of the bureau in 1919 and, except for a period of two years in which he supervised research and development of American Magnesium Corp.'s plant in Niagara Falls, N. Y., he has been continuously engaged at the laboratories. Mr. Dix's service with the company dates from 1923. He became chief metallurgist in 1930. Mr. Templin was appointed chief engineer of tests in 1919 and his service with the laboratories has been uninterrupted.

R. L. Templin

E. T. Dix Jr.

Herman E. Bakken

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Gerald N. Abt, formerly field sales manager, has been appointed sales manager, tool division, Barcalo Mfg. Co., Buffalo.

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John W. Schlendorf, formerly associated with Carnegie-Illinois Steel Corp.'s sheet sales department, has been appointed Cleveland district manager for Century Steel Corp., Chicago. He will handle sheet purchases as well as sales.

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Robert A. Miller, formerly assistant chief tool engineer, hoist division, Willys-Overland Co., Toledo, O., has been appointed head of a new engineering division of the Agerstrand Corp., Muskegon, Mich.

OBITUARIES . . .

Edward W. P. Smith, 56, consulting engineer, Lincoln Electric Co., Cleveland, died Sept. 19. Before joining Lincoln, over 20 years ago, he served in the electrical inspection department of the city of Cleveland and was subsequently employed by Westinghouse Electric & Mfg. Co. at Pittsburgh. During the past year, he had traveled extensively in the interests of the war production program, giving expert advice and lectures on welding techniques as applied to construction of war equipment.

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Harry J. Sweeney, 38, chief metallurgist, Republic Steel Corp. and professor of the Youngstown College chemistry department's metallurgy division, died Sept. 14 in Youngstown, O.

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R. D. Hunt, executive vice president, Dexter Co., Fairfield, Iowa, manufacturer of washing machines, died in Iowa City, Iowa, Sept. 15. He was one of the founders of the American Washer and Ironer Manufacturers' Association.

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Otto Mueller, 53, managing director, Pressed Steel Co., Oxford, England, died in that city Sept. 13. He formerly was associated with the Edward G. Budd Mfg. Co. in Philadelphia and Detroit and was sent to England by that company in 1926 to manage the Pressed Steel plant. His last visit to this country was in 1932.

Edward W. P. Smith

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Henry Lanz, 67, president, Northwestern Plating Works, Chicago, died in Riverside, Ill., Sept. 15. A native of Austria, he came to the United States when a boy.

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Ervin A. Wolff, vice president and general manager, Superior Mold & Iron Co., Penn, Pa., died in Wilkinsburg, Pa., Sept. 12. Prior to his connection with Superior Mold he was superintendent for the Pittsburgh Grey Iron Foundry Co. and Bollinger-Andrews Construction Co.

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Robert T. Scott, 61, vice president, Chicago Pneumatic Tool Co., Chicago, and head of the New York City office, died Sept. 18 in Grand View, N. Y.

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Isaac W. England, 69, vice president, Continental Can Co., New York, died at Glen Springs, N. Y., Sept. 18. He formed the Passaic Metal Ware Co., Passaic, N. J., to can food for the American army during the Spanish-American War. This company merged with Continental Can after World War I.

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George G. Knox, administrative officer of the Zinc Branch, War Production Board, died Sept. 20 at Washington. Following his service in the First World War, he became secretary and assistant to the president, United Verde Copper Co., New York. He had been in Washington about a year.

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Edward H. Thomas, New York office manager, Farrel-Birmingham Co. Inc., Ansonia, Conn., died Sept. 13 in Pittsburgh. He was widely recognized in the cane sugar and marine industries as a capable designing engineer of equipment used by them.

Scheduling Plan Is Considered To Replace Present Priorities System

THE ENTIRE priorities system may be abandoned before the end of the year and replaced with a complete and detailed scheduling plan which would affect every manufacturing plant in the United States, it was reported from Washington last week.

As expressed by one WPB official, a new production code which was heralded as the simplified successor of the allocation classification system is a "dead pigeon". The production code was introduced two months ago at meetings of industrialists in two or three cities but other scheduled meetings were dropped and the code was referred to a special WPB committee for further study. The committee is said to have taken no specific action.

The Production Requirements Plan set up to provide for material needs on a quarterly basis also may be dropped in its entirety or salvaged only in part.

Ferdinand Eberstadt, former chairman army and navy munitions committee, and new vice chairman of WPB (P. 37) is in charge of materials flow and is reported to have voiced criticism of PRP which does not provide for the more exact control of materials made necessary by growing shortages on every hand.

Priority system falls down for the reason practically all equipment for the Army and Navy take top ratings and there is constant competition for material. In the case of steel, little or no material is available under AA-2, which means practically all requirements are lumped in the topmost brackets.

Under the new scheduling system which appears to be definitely in the picture, the structure controlling production and flow of steel plates probably will be followed as a pattern. Plate control is regarded as entirely successful since production in the mills is scheduled to mesh with pre-determined shipbuilding and other needs.

Copper was placed under a somewhat similar system although not as complete control, beginning Sept. 1, when allocations were matched with scheduled production of material.

It is felt that the time now is ripe to institute a scheduling system since both Army and Navy have a better picture of just what finished products are needed and when. At the outset, it often was necessary to revise schedules overnight to meet needs for military equipment most pressing at the moment.

WPB officials emphasize the point that no new materials control system has been set up as yet but they are "taking a look at the whole picture". The present rating plan, of course, will be continued until a more workable setup can be devised.

Iron and Steel Branch, WPB, already has worked out a quota plan whereby fixed tonnages of steel, based on raw ingots, would be allocated to Army and Navy, Maritime Commission, lease-lend and civilian supply, designed to eliminate confusion arising from the present rating system.

This plan is being held in abeyance until an overall system can be worked out covering all materials, now being developed by a special committee.

Regional WPB Offices To Offer High Ratings for Emergencies

To prevent stoppages or slow-downs in essential production that might arise from lack of small amounts of critical materials, WPB has authorized its regional offices to assign high preference ratings for the use of earmarked materials in emergency situations.

Under this regional emergency materials plan, preference ratings up to AAA to avoid positive losses of essential production and up to AA-2X for other emergency cases may be assigned.

The quantities of materials against which such preference ratings in the agreements may be assigned each month are not to exceed a small specified percentage of the available supply of each material.

During the first month only ten of the twenty-three specified materials may be authorized.

These are: Aluminum, brass, copper (refined), lead, nickel, pig iron, steel (scrap), (assorted structural), and (other except plate), zinc.

Other materials to be included later in the plan are: Cadmium, ferrochrome, cobalt, cork, formaldehyde, molybdenum, rubber (crude) and (synthetic), tantulum ore, titanium ores, tin, tungsten, vanadium.

PRP Applications for Last Quarter Being Processed

Production Requirements Plan certificates for the fourth quarter are being returned to applicants, it was announced by Ernest Kanzler, Director General for Operations.

Applications have been analyzed, total estimated requirements have been balanced against available supplies and material, and the Program Adjustment Committee has made its recommendations for cutting back the requirements to balance the supply. These recommendations were passed on finally by the Requirements Committee last week and final processing of the fourth quarter Production Requirements Plan applications started.

Pending return of all the applications, the provisions of Priorities Regulation No. 11 for an interim procedure have been modified by Amendment No. 4. As before, companies which have not yet received their fourth quarter certificates may order up to 40 per cent of their estimated fourth quarter requirements for delivery in October. Amendment provides, however, that they may not apply preference ratings before receiving their certificate to more than 70 per cent of their estimated fourth quarter requirements, and they may not apply ratings under the interim procedure to a greater volume of material than they actually put into production in the first two months of the third quarter.

Sale of Single Lots of Carbon Steel Authorized

Priorities Regulation No. 13, issued last July to provide uniform rules to govern sales to war industries of frozen stocks of restricted materials, has been amended to exclude any material rationed at retail levels, to include intra-company transfers of material in specified circumstances, and to clear up certain ambiguities which have come to light during the course of operations in the field.

Specifically included within the scope of the regulation by the amendment are sales made in the course of the liquidation of a going business or the assets of such a business. Intra-company transfers are allowed under the same conditions as are sales of the given material.

Schedule A to Regulation 13 also is amended to include a number of items placed under priorities control since its issuance, and to alter the conditions under which frozen or otherwise idle stocks of certain materials may be disposed of.

The most important change in Schedule A permits sale for authorized uses, on ratings of AA-2X, of single lots of carbon steel of more than five short tons. Single lots are defined in the amended regulation as "all material of the same size and specifications at the same location." This change is expected to ex-

PRIORITIES–ALLOCATIONS–PRICES

Weekly summary of orders and regulations issued by WPB and OPA, supplementary to Priorities-Allocations-Prices Guide as published in Section II of STEEL, July 6, 1942

M ORDERS

M-89 (Amended): Corundum, effective Sept. 16. Includes control over use of corundum in consumers' hands. Covers corundum ores and superfine flour as well as aluminum oxide suitable for abrasive use. Consumers file PD-294 with WPB by 10th each month. PD-294A is application of user for delivery. Suppliers file PD-293 by 10th each month with WPB.

M-196: Cryolite, effective Oct. 1. Provides for complete allocation and use control, requiring WPB authorization for delivery, receipt or consumption, except for receipt and use as an insecticide. Authorization requests are made to WPB on PD-592.

P ORDERS

P-89 (Amendment): Chemical Plant Supplies, effective Sept. 19. Raises to A-1-a the rating assigned for obtaining all metals appearing on List No. 1 of PD-25A for fourth quarter and all fabricated parts and equipment having a unit cost of $250 or less. Assigns A-1-c rating to all other materials needed for maintenance, repair and operating purposes. Ratings higher than A-1-a will be assigned to repair plant breakdowns and for other emergencies upon application to WPB. Ratings may not be applied to purchase of metal containers or container materials without WPB authorization

L ORDERS

L-163 (Amendment): Turbo-Blowers, effective Oct. 1. Revises definition of turbo-blowers covered by order to include those having capacity of 5000 cubic feet per minute or more, at a total equivalent sea level air pressure of 1½ pounds per square inch or more.

L-173 (Amendment): Space Heaters, effective Sept. 19. Removes restrictions of original order on production of gas unit heaters.

L-183: Electronic Equipment, effective Oct. 3. Prohibits production of such devices in excess of a minimum inventory required to meet deliveries on orders rated A-3 or higher, in no case exceeding 12½% of total 1941 sales. Bans transfers except on orders rated A-3 or higher. Does not cover devices used in hearing aids, telephone and telegraph equipment, medical and therapeutic equipment and light and power equipment.

PRIORITIES REGULATIONS

No. 11 (Amendment): Production Requirements Plan, effective Sept. 19. Revises interim procedure for placing of orders before receipt of certificates by companies operating under PRP. Prohibits application of preference ratings to more than 70% of company's estimated fourth quarter needs and to a greater volume of material than actually put into production during July and August, 1942.

No. 13 (Amended): Sale of Idle Materials, effective Sept. 23. Permits sale for authorized use, on ratings of AA-2X, of single lots of carbon steel of more than 5 net tons. Allows intra-company transfers under the same conditions as sales of the given material. Includes items placed under priorities control since issuance of original order.

PRICE REGULATIONS

No. 222—Northern Softwood Lumber, effective Sept. 23.

No. 223—Northern Hardwood Lumber, effective Sept. 23.

No. 224—Cement, effective Sept. 23. Sets up specific maximum prices for 12 districts, covering sales by manufacturers within and outside their normal market areas.

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pedite the movement from immobilized stocks of this essential war metal. Previously, sale of lots of more than five tons might only be made to producers of the material in the same form in which it had been purchased by the holders.

Price Ceiling on Rough and Machine Steel Castings

Definition of steel castings in Revised Price Schedule No. 41, steel castings, has been changed to make it clear that it covers both rough and machine castings.

Amendment No. 3 to the schedule, effective Sept. 24, 1942, states that "steel castings" means cast steel objects "whether rough or machined." Previously the words "whether rough or machined" did not appear in the definition.

OPA pointed out that machining operations on a casting performed by the foundry making the casting are covered by Revised Price Schedule No. 41. Machining operations on castings performed by persons other than the original producer are priced under Maximum Price Regulation No. 136, machines and parts and machinery services.

Holland Names Consultants to WPB Small Business Division

Lou E. Holland, head of the WPB Smaller War Plants Division, has announced a board of consultants to serve in an advisory capacity to the division and to the Smaller War Plants Corp. of which Mr. Holland is chairman. Consultants named are:

George Trundle, Trundle Engineering Co., Cleveland.

William B. Stout, Stout Engineering Laboratories, Detroit.

Stanley A. Carlson, Howe Machinery Co., Passaic, N. J.

W. B. Connell, West Side Machine Works, Kansas City.

Ivan L. Johnson, Pacific Steel Casting Co., Berkeley, Calif.

"In the composition of this group of advisors," Mr. Holland said, "I have endeavored to combine high engineering talent and practical experience with the problems of small business. Mr. Trundle is the head of an engineering company well known throughout the country. Mr. Stout is known by everyone as an outstanding aircraft engineer. Mr. Carlson (who organized the Home Workshop group in Passaic), Mr. Connell and Mr. Johnson are successful in operating small business enterprises and have had a great deal of experience in the past two years in the problems that confront small business in connection with its adjustment to the war economy."

Second-Hand Machine Tool Dealers Licensed by OPA

Automatic licensing of all dealers selling used machine tools or extras, or second-hand machines or parts, has been announced by OPA.

Supplementary Order No. 20, effective Sept. 26, also requires every second-hand machine tool or second-hand machinery dealer to register with the Washington office of OPA or at any OPA regional State or district office.

A dealer's license may be suspended if he violates any provision of Supplementary Order No. 20 or any price schedule or regulation covering such machine tools and machinery. The dealer thereupon loses his privilege to do business.

Maximum prices for second-hand machine tools or extras are established in Revised Price Schedule No. 1, second-hand machine tools. Those for machines and parts are provided in Maximum Price Regulation No. 136 as amended, (machines and parts and machinery services).

Ceiling prices for used machine tools range from 50 to 95 per cent of the prices of equivalent new machine tools, according to age and condition. For the used machines and parts covered by Maximum Price Regulation No. 136 as amended, a maximum price of 85 per cent of the maximum price of the nearest equivalent new machine or part is permitted for a rebuilt and guaranteed machine, and 55 per cent if sold on an "as is" basis.

Supplementary Order No. 20 does not apply to retail sales of second-hand machine tools or extras, or second-hand machines or parts.

Plan To Switch More Steel Products to Bessemer Class

Further efforts will be made to switch more steel products to bessemer steel, "which is far better than most people think it is", according to officials of WPB's Iron and Steel branch. Bessemer, normally used principally for screw machine stock and wire, can be used for plates, small structurals, sheets, pipe, bars, track spikes, nails and tie plates, it was pointed out. No plans are reported under way for additional bessemer capacity, however, due to lack of adequate pig iron supplies, but an effort will be made to make better use of existing facilities.

WINDOWS of WASHINGTON

Important decisions still made at 718 Jackson Place. CIO's influence in national affairs traced by recent events. Drive is on to reduce paper work, ease pressure on manufacturers

FOR MANY years decisions reached in the dignified, graystone-faced building at 718 Jackson Place, in the shadow of the White House, have had an important influence in shaping policies that have molded our national destiny. There the Republican National Committee had its headquarters and there it was that powerful political personages like Mark Hanna and Boies Penrose held sway.

Today the building has new occupants —but it has not lost one whit of its old prestige as an important headquarters for national policy making. The new owner is the Congress of Industrial Organizations, a body, as employers throughout the country so well know, which wields great political power at the present moment in our history.

The piecemeal manner in which news develops and is presented to the public might perhaps prevent the average observer from appreciating just how much influence the CIO exercises over our body politic today. It may be useful as a starter, therefore, to recall some recent developments and trends.

Sometime back CIO recommended the appointment of labor-management committees as a means for increasing war production. Donald M. Nelson, as chairman of the War Production Board, gave approval to this recommendation with the result that more than 1400 such committees have been appointed to date. Incidentally, almost everybody conversant with the results now admits that this was a fine idea.

CIO went on record as being opposed to the federal sales tax on the ground that this would work hardships on workers with low incomes. Individual congressmen here and there rise to the floor and advocate a sales tax. But Congress as a whole so far has evaded this issue.

Wants Greater WPB Representation

Philip Murray, CIO's president, for some months has been insisting that labor be given greater responsibility in the War Production Board in order that it may contribute more effectively to the production drive. Recently Mr. Nelson gave assurance that he would shortly reorganize the board in keeping with this request.

CIO does not want a wage czar, nor does it favor freezing wages. Rather, it wants "stabilization" of wages. CIO feels that the present War Labor Board understands labor's needs. It likes the manner in which the board functions and wants to have it continued as the government agency in control of wages. Careful readers of the speech that President Roosevelt broadcasted over the radio Labor Day drew the impression that this also is just about exactly what the President wants.

Recently the CIO United Automobile Workers of America revised a number of contracts relinquishing the double-time pay for work on Sundays and holidays. None of the AFL unions followed suit. In his Labor Day speech President Roosevelt failed to refer to this subject whereupon the White House began to be bombarded with telegrams threatening fearful consequences. Immediately the President issued an executive order rescinding payment of double-time wages for Sundays and holidays.

Occupy 3½ Floors

This is only a small part of the record but it will serve by way of illustration.

A visit at CIO headquarters quickly shows that it is thoroughly organized and staffed to conduct many related activities. Its new headquarters contains quarters for the national officers, for a large and industrious publicity department, for a research staff, for a hard-hitting organizing department and for legal and other activities. CIO occupies the fifth, fourth and third floors and half of the second floor of its new building.

What are the CIO officers doing, thinking and planning these days? How do they look to the future? Are they satisfied with the progress they so far have made? What are their complaints? These are some of the questions that naturally come to mind on entering the portals of this historic building.

These questions may be answered at least in part by recalling what a CIO officer said a couple of years ago when he was questioned about the very considerable amount of violence and disorder that was incident to this body's original organizational drives. He thought a moment and explained that violence and disorder are characteristic of the organizing period but, he added, "when that period is over and the workers in a plant or an industry have been won over to union membership, then comes the period of labor statesmanship."

Today it is quite clear to an unbiased visitor that the CIO feels that the period of labor statesmanship has arrived and now is in full flower. CIO feels that it now is an accepted institution and that its policies are in the best interest not only of labor but of the country.

"We gave up the right to strike with Pearl Harbor," says a CIO spokesman. "No strikes have been authorized since then and no strikes will be authorized as long as the war lasts. Yes, there have been some unauthorized walkouts, and these have been very embarrassing to us.

"At the same time we have to be

CIO President Philip Murray and representatives of all CIO national unions and state councils confer on the organization's war-time policies. NEA photo

patient for the reason that people are human. Great numbers of workers are laboring under pressures. They work long and hard and many of them suffer from poor housing and transportation conditions. Their wives complain about high prices they have to pay at the grocery store, and for shoes and clothing of inferior quality. The men get irritated and high-strung and are in a mood to develop grievances. All of a sudden they decide to strike.

No Members Expelled

"We understand this situation and none of our unions so far has gone to the extent of expelling members. That is a very serious matter and it is much better for our war effort to exercise sympathy and patience than to take drastic action. These strikes never last very long and their effect on the total war effort is negligible. On the whole we are proud of our record since Pearl Harbor. President Roosevelt and Donald M. Nelson have complimented us on numerous occasions, particularly on Labor Day when they and numerous other government officials congratulated labor on its part in the war production program.

"And don't forget," continued the spokesman, "that there are plenty of dumb foremen who do not know how to handle men when their nerves are at hair trigger. The same thing goes for many managements."

Questioned as to what CIO had in mind in demanding a larger share of responsibility in the direction of the war production program, the spokesman explained.

"The CIO wants more production—and we know how to get labor to produce more. Therefore, we should be given a greater opportunity to contribute to the production effort. To get the utmost from labor you have to function to a large extent by means of men who understand labor's psychology. This fundamental truth is not as well understood as it should be.

"For example, when we recommended the appointment of labor-management committees there was a great deal of suspicion as to our motives. We were accused of trying to utilize a new device to gain more power. Fortunately, Mr. Nelson accepted our recommendation. More than 1400 such plant committees now are functioning all over the country and everybody now is informed about the improvement in production efficiency that has resulted from the activities of these committees. This idea should be carried out universally. There should be a labor-management committee in every plant. Labor can contribute brains as well as brawn when given the opportunity."

THIS Double-V emblem has been adopted by the United Automobile Workers, CIO, and its local unions, according to union officials to signify "a determination to fight for democracy in the world and at home." It was conceived by the Pittsburgh Courier, *Negro weekly newspaper*

CIO is 100 per cent behind the seven-point program which President Roosevelt outlined early this year and which he again reiterated in his Labor Day speech.

"We want rationing of all consumer goods," declares the CIO spokesman. "People with large incomes can lay in large stores of coffee, tea, canned goods, clothing and so on. The average worker with an hourly wage rate cannot do that. Between the rising cost of living, payment of taxes and the purchase of war bonds he does not have money left for such investments.

"To protect him and his family against the hoarders we need an all-out rationing system in which everybody, no matter what the size of his bankroll, will share alike. We do not care whether $1000 radio sets are rationed. We do insist on complete rationing of such necessary items as food and clothing."

The sincerity of the CIO drive for more war production is proven in numerous ways, particularly by its 62-page brochure entitled "Producing for Victory—a Labor Manual for Increasing War Production." This breaks down into four sections "Improving the Efficiency of Production," "Increasing the Productivity of Equipment," "Effective Use of Materials," and "Effective Controls." This manual contains many valuable pointers; copies of it may be had from the CIO at 15 cents.

None of the foregoing is intended to reflect any falling off in aggressiveness on the part of the CIO. This organization, like any business organization, is taking advantage of every opportunity to increase its domination of labor and promote its future security. At present it is organizing the nonferrous smelter and refinery workers as well as the employes in the copper and brass mills. But it believes that while these drives will redound to the benefit of CIO, they also will be helpful to the production program, so that the country will be gainer rather than loser.

CIO hails it as a significant feature that in its present organizing effort it is meeting with no opposition from employers. This is in marked contrast with the stormy weather it encountered when it first appeared on the scene. Under the present governmental policy and in the light of court decisions in recent years, it appears that employers in general take the attitude that it is futile to offer resistance to union organizing drives.

CIO's full program has not yet become operative. It has very firm ideas as to controlling business and employment after the war. It advocates such control through industry committees made up of representatives of labor, management and the public. More will be heard along these lines in the future.

Executives Advised To Publicize Salaries—Also Taxes, Benefactions

Every now and then, as industrial executives know, the newspapers publish lists of fat salaries that are paid to top-flight men in managerial positions. Once considered as information of a confidential character, large salaries now must be publicized by the Treasury Department under the law. Appearance of these lists, of course, creates discontent among workers and their wives and provides fine ammunition for labor organizers and for politicians.

A public relations man from New York who spends considerable time in Washington raises the question as to how long the executives affected will continue to suffer silently.

"Some day," he says, "a public rela-

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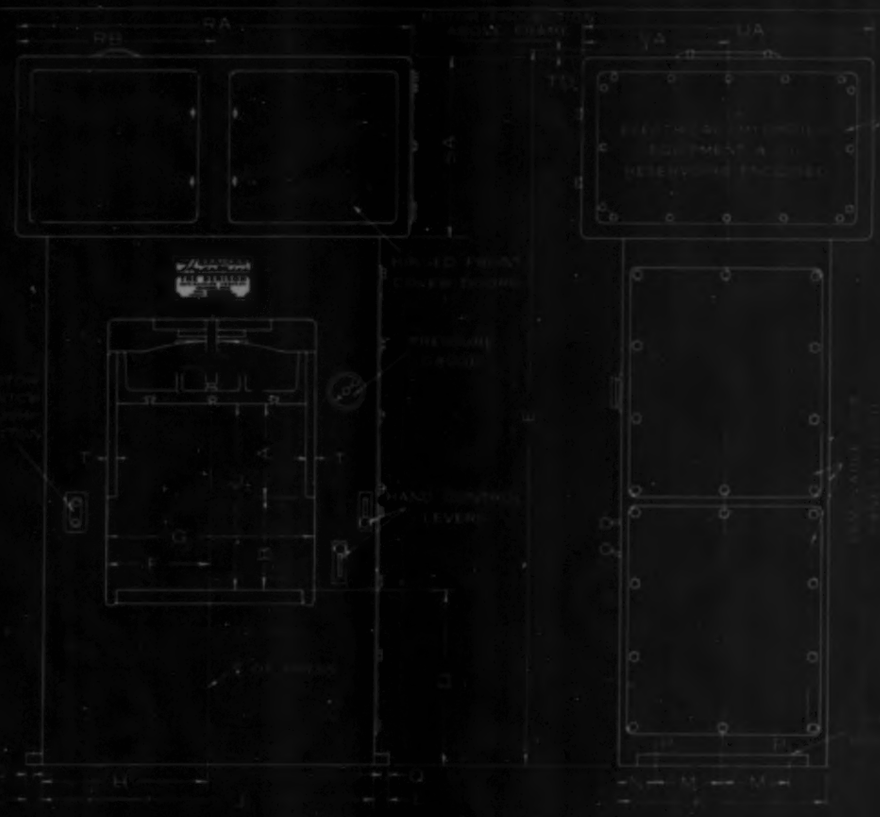

DIMENSIONS	
DLOS 2-100	
A	18
B	18
C	36
D	33 1/2
E	138
F	20
G	40
H	32
J	64
K	40
L	3 1/2
M	13
N	7
P	1 3/8
Q	1 1/2
RA	76
RB	38
SA	34 1/4
TA	2
TB	1 3/8
UA	56
VA	28
W	20.000
X	20.100
Y	20.250
Z	750

SPECIFICATIONS	DLOS2
MAXIMUM WORKING CAPACITY TONS	100
CYLINDER BORE INCHES	12
RAM SPEED DOWN (HIGH PRESSURE) F.P.M.	1.0
RAM SPEED DOWN (RAPID TRAVERSE) F.P.M.	11.0
RAM SPEED UP F.P.M.	25.0
PUMP VOLUME GALLONS PER MIN.	60-10.5
MAXIMUM WORKING PRESSURE P.S.I.	2000
MOTOR H.P. 1200 R.P.M.	10.0
RAM DIAMETER INCHES	9.000
UPPER PLATEN SIZE INCHES	36 X 36
OIL RESERVOIRS CAPACITY GALS.	180

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tions man in one or another of the large corporations is going to steal this particular ball and run it across the line for a touchdown.

"He will release a story on the salaries his company paid its top officials during the previous year—and will beat the government to the draw. In his release he will not only state the amount of each salary but also the net amount that was left to the recipient after the payment of his income tax. It will list benefactions made by these individuals. It will tell about club dues and other expenses for essential business purposes. It will explain what amount of money was invested during the year to create additional jobs. It also will explain the importance of the services of these men in enhancing the position of the company and—of course—its employment position. The report would make it clear that these men are worth their keep and that they assist in stepping up our economy rather than siphon it off.

"Whether industrial managers like it or not," he concludes, "salaries no longer are secret. The quicker industrial executives realize that this game as to salaries can be made a two-sided affair, the quicker we will find them striking back in an intelligent and effective way. As things now are done, it is desirable that every corporation's annual report should set forth full and correct information as to top salaries."

New Group Reduces Request for Data

The recently appointed War Production Board Committee for the Review of Data Requests from Industry already has made some headway in reducing the large amount of paper work which industry has had to do in order to furnish information. Joseph I. Lubin, chairman of this committee, states that effective steps have been taken to eliminate "bootleg" or unauthorized data requests, including those sent out by telegraph.

Since July 1, all new forms and reprints of old forms have been standardized in format and the size reduced so that they can be filled out in a typewriter with a standard carriage.

A number of specific cases of duplication reported by industry have been eliminated. In some instances telegrams have been sent to respondents advising them to discontinue the filing of a questionnaire, such as Cadmium Form PD-442; also, certain other forms, as PD-99, 138 and 139, have been combined. Pending the complete revision of all forms, individual questions have been eliminated from some forms and respondents advised accordingly.

Recently representatives of the chemical industry were asked to review a new proposed standardized form which, after several meetings, was unanimously approved both by the industry and WPB. It will be used in place of individual forms for future allocation of chemicals and will gradually replace forms now in use for this purpose.

As the forms used by each division and branch of the War Production Board are reviewed representatives of the affected industries will be called in as advisers and their recommendations requested.

Mr. Lubin points out that, while a great many forms are essential for direction of war production, it is intended to hold information requests to a minimum. Any manufacturer who has ideas as to how present paper work in reporting can be reduced will meet with a warm reception at Mr. Lubin's office, located in Room 5419, Social Security building, Washington.

It may be added parenthetically that the committee already has made itself unpopular with some officials in WPB. As a result of this committee's rulings, a number of data request forms may not be sent out despite the fact that the officials involved declare they call for needed information. Whether these complaints are justified or not, they tend to prove that the committee is doing its job aggressively.

Nonferrous Metals Transportation Advisory Committee Appointed

Formation of a copper, lead and zinc producers industry transportation advisory committee was announced last week by T. Spencer Shore, chief of the WPB Division of Industry Advisory Committees. George C. Heikes, chief of the WPB Zinc Branch, is government presiding officer.

"Effects of the War on British Marketing"

Careful study is being devoted in a number of government offices here to a new 74-page Department of Commerce book entitled "Effects of the War on British Marketing." It covers the English experience to date with price control, control of supply, "nucleus" firms and the effect of these activities on manufacturing, wholesaling and retailing organizations. It is regarded as of importance since it is anticipated that many measures that have worked well in England will be applied here. By reading it one gets a sort of review of our marketing methods of next spring or next summer. Copies of the book may be obtained from the Superintendent of Documents, Washington, at 15 cents.

Relieving Pressure On Manufacturers

Demand for heat treating equipment has been so large that a number of companies manufacturing equipment of this type are sold far ahead, with no help in sight. On top of this the demand has been coming from many different sources so that the heat treating equipment builders have been subjected to pressure from all directions. This has come from expediters who have been trying to get their particular orders higher up in the scale of priority in order to get quicker delivery.

Recently the War Production Board decided some action was necessary to free the heat treating equipment manufacturers from harassment of this kind. It instituted a system whereby a number of larger manufacturers submit reports listing the orders on their books. The Heat Treating Unit of the Tools Division of WPB handles these reports, analyzing them from the point of view of military necessity, and arranges them according to the relative urgency of each order.

Reports are then made to the manufacturers who are able, as a result, to arrange their production schedules according to relative urgency. Under this arrangement the manufacturers are not permitted to change their schedules unless instructed to do so by WPB. That means that, to get action, expediters of customer companies requiring heat treating equipment have recourse only to WPB.

So far this system has been applied only to manufacturers who have been highly pressured. The system may be made available to other heat treating equipment manufacturers who may become pushed in the future.

Although this system has been in operation only a short time, it has been found to promote manufacturing efficiency. The plants covered by the system have been able to increase their production by 5 to 8 per cent.

Directives issued under this system are signed by the Director General of Operations of the War Production Board, thus automatically relieving the manufacturers of any contract liability.

Two Vice Chairmen, Steel Chief Appointed to Production Agency

LATEST reorganization of the War Production Board infuses top-notch executive and manufacturing ability into output of war materiel.

Outstanding among these appointments are:

1. Charles E. Wilson, president, General Electric Co., as WPB vice chairman to "be the top production authority in the war program and have the responsibility of seeing to it that programs and schedules for all phases of our war efforts are met". Mr. Wilson also will serve as chairman of a newly-organized Production Executive Committee, which includes high ranking officials of the Army, Navy and Maritime Commission.

2. Hiland G. Batcheller, president, Allegheny Ludlum Steel Corp., Pittsburgh, as chief of the WPB Iron and Steel Branch. Mr. Batcheller succeeds Reese H. Taylor, who resigned to return to his position as president of the Union Oil Co. of California.

3. Transfer of Ferdinand Eberstadt, formerly a New York financial man, from the chairmanship of the Army and Navy Munitions Board to a vice chairmanship of WPB in charge of programs and schedules. He will be responsible for the flow of materials to manufacturers and producers throughout the war effort, taking over that job from James S. Knowlson, also a WPB vice chairman.

The shift will leave Mr. Knowlson free to give his time to the British-American Combined Production and Resources Board.

Mr. Eberstadt also will serve as chairman of the WPB requirements committee, and will have as his assistant Ernest Kanzler, Director General of Operations.

Mr. Wilson accepted the WPB position after repeated requests from Donald M. Nelson, chairman of the war production agency, from the Secretary of War, the Secretary of Navy and finally from the President. Mr. Wilson has resigned from all positions he held with General Electric and will devote his full time to the new job.

In addition to being the top production authority, Mr. Wilson will head the Production Executive Committee organized by Mr. Nelson to bring together top officials of the WPB, the armed services and Maritime Commission to maintain a constant check on control of the production program. Committee will meet twice weekly. Other members are:

Lieut. Gen. Brehon B. Somervell, commanding general of the Army Services of Supply.

Maj. Gen. Oliver P. Echols, commanding general, Materiel Command for the Army Air Force.

Charles E. Wilson

"Top production authority in the war program" will be Mr. Wilson, until a few days ago president of General Electric Co.

Vice Admiral Samuel M. Robinson, director of materiel and procurement for the Navy.

Rear Admiral Howard L. Vickery, vice chairman, Maritime Commission.

Mr. Wilson has been president of General Electric since 1940 and associated with the company and its component, Sprague Electric Co., since 1899. He is the second top-flight GE executive to join the WPB; Philip D. Reed, chairman of the board, now is serving on a special mission in England.

Bachrach

Hiland G. Batcheller

President of Allegheny Ludlum Steel Corp., is now chief of the WPB Iron and Steel Branch. Mr. Batcheller succeeds Reese H. Taylor who resigned

To insure that the company's war output, estimated to reach $1,000,000,000 this year, be uninterrupted, General Electric directors have called back Owen D. Young, retired chairman, and Gerard Swope, retired president, to their old positions for the war's duration.

Mr. Batcheller, new Iron and Steel Branch chief, has been in the steel business since he was 24 years old. His first job was with Carnegie Steel Co., which he joined in 1909. Six years later he joined Ludlum Steel Co. as assistant to the president, a position he held until 1930 when he was elected president.

In 1938, he initiated and brought to completion the merger of Ludlum and Allegheny Steel Co., Pittsburgh, and became president of the new company.

For many months he has been a member of a steel advisory committee of the Army-Navy Munitions Board and is well known to many ranking Army and Navy production officials.

David F. Austin, deputy chief of the branch, and acting chief since Mr. Taylor's resignation, has been compelled by ill health to take an extended heave of absence.

Foreign, Domestic Commerce Director Granted Leave

Carroll L. Wilson, director, Bureau of Foreign and Domestic Commerce, has been granted a leave of absence. Mr. Wilson has gone on leave for the purpose of assisting in the organization of the Committee for Economic Development. The committee is a voluntary body of American business men, under the chairmanship of Paul Hoffman, president, Studebaker Corp., independently organized in collaboration with the Department of Commerce for the purpose of exploring the economic areas in which the public interest can be served in the postwar period.

The committee will endeavor to carry on for business generally research activities which many business men will not have time to engage in because of the pressure of their responsibilities in the war effort.

The committee's overall objective is to develop, if possible, a program of public service for American business which can be co-ordinated with all other such developments at the close of the war.

Grosvenor Jones will be acting director of the bureau.

Board Supports CIO in Attempts To Extend "Little Steel" Ruling

FORTY-ONE steel companies have been told by the National War Labor Board "to show cause" why they should not incorporate provisions of the board's directive in the Carnegie-Illinois Steel Corp. case in contracts with the United Steelworkers of America.

Provision of the Carnegie-Illinois ruling called for a 44-cent daily wage increase retroactive to Feb. 15, maintenance of membership and checkoff, and minimum daily wage guarantee. Similar provisions earlier had been handed down in the "Little Steel" case.

The unprecendented ruling by the board was made in an effort to equalize wages and contractual relations throughout the entire industry. The companies affected operate blast furnaces, steelworks, rolling mills, and steel foundries.

The retroactive wage feature has caused most of the difficulty in contracts that the union has been trying to obtain since its victory before the board in the "Little Steel" case. The companies have held that making the wage increase retroactive to February invalidates firm contracts in effect with the union. Some of the companies also have rebelled against inclusion of the maintenance of membership and the checkoff provisions.

Steelworkers Asked Action

The board's request that the companies "show cause" was made upon demand by the United Steelworkers of America. The ruling reads as follows:

"The United Steelworkers of America, under date of Sept. 3, 1942, filed with the chairman of the National War Labor Board a request that the board direct certain companies in the basic steel industry to include in their collective bargaining contracts with the United Steelworkers of America all provisions contained in the board's directive order of Aug. 26, 1942, involving Carnegie-Illinois Steel Corp. A copy of that order is attached hereto. Your company is included among those listed by the United Steelworkers.

"You are hereby requested to submit to the board within ten days your reasons, if any, why the provisions of the board's decision in the case of Carnegie-Illinois Steel Corp. should not be incorporated in your contract with the United Steelworkers of America."

Companies receiving the request:

Struthers Iron & Steel Co., Struthers, O.
Allegheny Ludlum Steel Corp., Pittsburgh.
American Locomotive Co., Latrobe, Pa.
Atlantic Steel Co., Atlanta, Ga.
A. M. Byers Co., Pittsburgh.
Continental Steel Corporation, Indianapolis.
Empire Sheet & Tin Plate Co., Mansfield, O.
Jones & Laughlin Steel Corp., Pittsburgh.
Latrobe Elec Steel Co., Latrobe, Pa.
Pittsburgh Steel Co., Pittsburgh.
Sharon Steel Corp., Sharon, Pa.
Stanley Works (American Tube and Stamping Divisions), Bridgeport, Conn.
Universal-Cyclops Steel Corp., Bridgeville, Pa.
Acme Steel Co., Riverdale, Ill.
American Chain & Cable Co., Page Steel and Wire Division, Monessen, Pa.
Wheeling Steel Corp., Wheeling, W. Va.
Apollo Steel Co., Apollo, Pa.
Babcock & Wilcox Tube Co., Beaver Falls, Pa.
National Supply Co., Spang-Chalfant Division, Pittsburgh.
MacKintosh Hemphill Co., Pittsburgh.
National Erie Corp., Erie, Pa.
National Malleable & Steel Casting Co., Sharon, Pa.
Taylor-Wharton Iron & Steel Co., Easton, Pa.
United Engineering & Foundry Co., Pittsburgh.
Lewis Foundry & Machine Co., Coraopolis, Pa.
Pittsburgh Rolls Corp., Pittsburgh.
National Alloy Steel Co., Blawnox, Pa.
Shenango Furnace Co., Pittsburgh.
Mercer Tube & Mfg. Co., Sharon, Pa.
Moltrup Steel Products Co., Beaver Falls, Pa.
Penn Iron & Steel Co., Creighton, Pa.
Pollak Steel Co., Cincinnati.
Wheatland Tube Co., Philadelphia.
Wyckoff Drawn Steel Co., Pittsburgh.
Andrews Steel Co., Newport, Ky.
Reliance Steel Casting Co., Pittsburgh.
Heppenstall Co., Pittsburgh.
Jessup Steel Co., Washington, Pa.
Judson Steel Corp., Oakland, Calif.
Vanadium-Alloys Steel Co., Latrobe, Pa.
Columbia Steel & Shafting Co., Philadelphia.

ROLL OF MISSING MEN

SUGGESTED for plants where absenteeism cuts production, forms like this containing names of absent employes are being used at Westinghouse Electric & Mfg. Co.'s East Springfield, Mass., plant. No excuse is accepted. The missing man's name goes on the red and blue poster, 11 x 14 inches in size, and duplicates appear all over the shop

78,000 in Bethlehem Shipyards Given $15,000,000 Pay Increase

Annual wage increases totaling about $15,000,000 and other concessions were granted to about 78,000 workers in eight shipyards of Bethlehem Steel Co. in a contract signed recently with the Industrial Union of Marine and Shipbuilding Workers of America-CIO.

The agreement, reached after more than a year's negotiations, provides for maintenance of union membership and checkoff, prohibits strikes and lockouts, establishes grievance and arbitration machinery, and provides for paid vacations and seniority rights.

Wage scales are $1.20 an hour for mechanics and 80½ cents an hour for unskilled labor. These represent an 8-cent increase over former rates.

10,000 Shipworkers Strike Over 5-Cent Ferry Toll

State militia and mobile police took over on Sept. 18 the approaches to the Pinto Island shipyard of Alabama Dry Dock & Shipbuilding Co., Mobile, Ala., and the City Hall and Court House, as 10,000 shipworkers went on strike to protest a five-cent fee charged by the city's new ferry service to the plant. They later voted to return to work, pending a National War Labor Board hearing, only on condition that they would not be obliged to pay the fare.

The company previously had operated its own ferry service, but this was found to be inadequate. The city inaugurated the toll ferries as a war measure to supplement bus and automobile transportation at the express request of the Maritime Commission. The commission described the work stoppage as "unwarranted" and a violation of existing agreements and refused to discuss grievances with a delegation of workers until operation of the yards was resumed. A local official of the Shipyard Workers' Union, CIO, denied that the union had authorized the strike.

Social Service Agencies Under McNutt's Direction

United States Employment Service and three other social service agencies have been placed under the control of Paul V. McNutt, chairman of the War Manpower Commission, by President

(*Please turn to Page* 106)

Toolmaker Explains Fears of Workers

Urges economic and political leaders to pledge efforts to avert postwar unemployment

WHAT is wrong with the morale of workers in this country's war plants? A Cleveland toolmaker, Rudolph R. Blumer, born in Switzerland, takes cognizance of the criticisms directed against war workers' morale and suggests a remedy, in an interesting letter to the *Cleveland Plain Dealer*.

His letter, in part, follows:

"You allude to the attitude of a very large section of our war workers in failing to see the necessity of all-out production and cite examples of how production is being retarded instead of pushed ahead.

"I am a worker in a war plant and I know only too well that these conditions do exist, and I fully realize to what frightful consequences they may lead. If then, in my comment on your column, I point out some differences of opinion it should be understood that in no shape, form or manner do I wish to justify, or excuse the mentioned abuses on the part of a good part of our war workers.

"Thurman Arnold, in his address at Cain Park, told us: 'The fear of postwar depression is laying a paralyzing hand on our efforts toward all-out production, and we should shake off that fear and take it for granted there will be no such depression.'

"Yet it is just this apprehension, I might say this anticipation, of a wave of reaction after the war which dampens the spirits of many war workers. Time after time in my feeble attempts to bolster the morale of some of my fellow-workers I would cautiously hint that we ought to work a little harder, that instead of working less than in peacetime, we should work more.

"Usually the reply is: 'Why should we? As soon as the war is over we will be walking the streets.' I would point out to them that President Roosevelt and his New Dealers have stood by us these eight or nine years and there was not going to be a depression as long as he and his men were in power. Most of the men will agree on this point, but invariably will ask me: 'And how about the next administration? Will it stand by us as F. D. R. does?'

"The very people who have fought and criticized every social reform achieved by the New Deal, who have tried in 1936 and 1940 to saddle us with candidates unfavorably inclined toward such reforms, these very people are telling us now that social experimentation is a luxury that was all right in peace, but could no longer be afforded in a country at war. All right, it may be that we can no longer afford it, or even need it right now, but will the powers that have been fighting these very gains be willing to restore them to us once the war is over? Or will it again become more important to balance the budget than to feed hungry children?

"We have only to read the speeches of senators like Taft, or Byrd . . . to realize that they are all set to take the country over and lead us back to what they so quaintly call a 'sound economy.'

"It may be sound according to their lights and their desires, but if memories serve us right we were told in Coolidge's and Hoover's time that theirs was a sound economy too. This would explain why a good many workers have no confidence in the future. They fear that business and finance want to rob them of the progress made.

Wants Assurance

"As it is we are a divided people, the upper third fearing that something may change, the lower third feeling that nothing will change; that instead of going forward on the path of social progress we will go back to normalcy, style 1920-1932. And the middle third does not know which alternative to fear or favor.

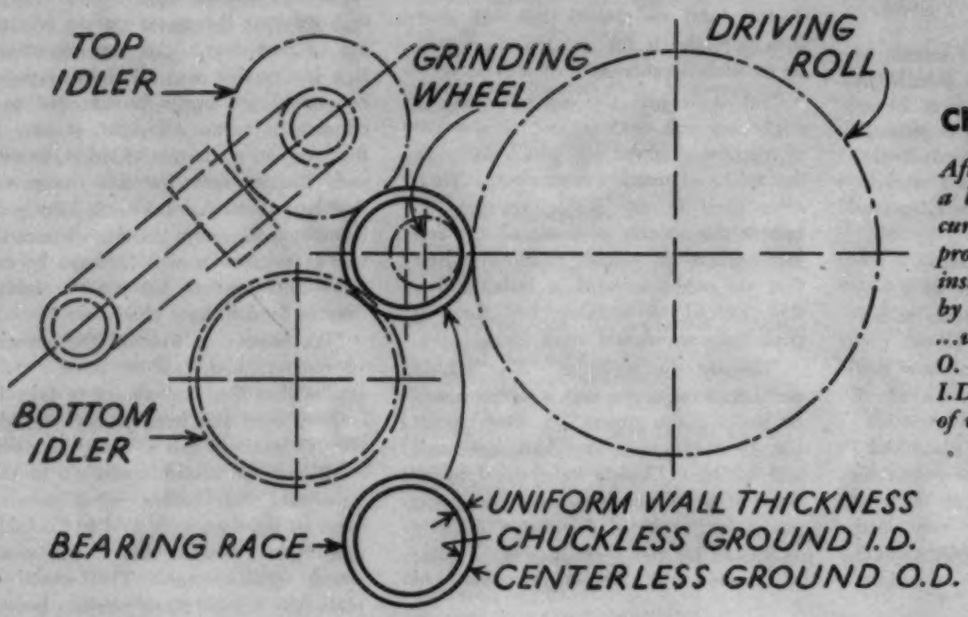
"There is only one kind of appeal that would be effective, in my opinion:

"If three or four top leaders each of the United States Chamber of Commerce, of the American Manufacturers Association, the Bankers Association, the committees would get together and this group of economic and political leaders would declare in a plain, signed statement published in all principal papers over the land, they pledge their influence and their power to be used after the war towards an effort to utilize the resources of the country, its manpower and its industrial and productive equipment for the purpose of achieving economic security to all willing to do an honest day's work for an honest day's pay. If the principle is accepted that society owes every man, not a living, but the opportunity to make a living honestly is accepted, then we will be on our way to build a better future here and all over the world."

FEDERAL SHIP ENCOURAGES SLOGAN WRITERS

FIRST prize, $100 War Bond, was presented to William F. Wright, machine shop worker, for the slogan "E Doesn't Mean Enough" in a contest sponsored by Federal Shipbuilding & Dry Dock Co.'s War Production Drive Committee. Gordon G. Holbrook, left, works manager of Kearny and Port Newark yards, shakes Wright's hand. Third from left is John W. Mahoney, electrician's helper, with a $50 bond for "Don't Talk Production—Produce." Right, Sinclair D. Cox, $25 bond, "Less Blarney—More Ships Like the Kearny." Ten thousand slogans were submitted

Hyatt's Gift To Industry Ten Years Ago Is Helping To Win The War Today!



INTERNAL GRINDING
Chuckless Method

After the outside diameter of a bearing race has been accurately ground by our improved centerless method, the inside diameter is controlled by our own chuckless method ...which utilizes finished race O. D. to produce concentric I.D. with absolute uniformity of wall thickness.

CHUCKLESS GRINDING is helping to speed up America's war effort... make precision manufacture possible at a mass production pace . . . and avoid material waste.

This entirely new grinding method was invented by Hyatt nearly twenty years ago. Our races have been produced by this precision process ever since.

Later, this great advance in grinding technique was made available to all industry.

Therefore, in addition to helping us make more and better Hyatt Roller Bearings for war machines, this gift from Hyatt helps other vital plants speed the day of an ultimate American victory.

Hyatt Bearings Division, General Motors Corporation, Harrison, N.J., San Francisco, Chicago, Detroit, Pittsburgh.

THE 50TH YEAR OF **HYATT *ROLLER BEARINGS***

By A. H. ALLEN *Detroit Editor, STEEL*

MIRRORS of MOTORDOM

Iron and steel likely to continue as basic materials for manufacture of tomorrow's motor car. . . . Design jungle refrigerator. . . . Industry 32 per cent past peak peacetime production rate

DETROIT

SPECULATION on the shape and size of the postwar automobile is so full of "ifs" that no two opinions come even close to agreement. But a conservative analysis might stack up about as follows:

The burden of a long, hard war will necessarily grind individual resources down pretty thin. Backlogs of war bonds may have to be converted into tax payments. There will have to be a sharp scaling down of both wage levels and "job" levels. The people this will hit the hardest are those who at the moment are earning more money than they ever thought possible. So, while there should be a fair market for automobiles, it is difficult to see the enormous boom which some government economists are painting for the postwar period.

This means that the motor companies are going to be compelled to exert every means to provide value for the dollars they are able to capture from customers; and in turn the pressure will again be turned on suppliers for "a price". The easiest way to give value is to take up where motor car manufacturing left off last year, rather than to launch out into new and untried fields where millions of dollars can be lost in a hurry.

Surplus of Lower-Octane Fuels

Stylists are tossing off lavish conceptions of the motor car of tomorrow with little thought to the manufacturing problems involved. Dreamers talk airily of motors half the weight of present designs, burning 100 octane fuel and giving economy as yet untouched. They give scant attention to such facts as this—that the only way to produce 100 octane fuel is as a by-product of the present motor fuels; so if automobiles are to use the present aviation type gasoline, what is to be done with the billions of gallons of the lower-octane fuels which refineries must produce to obtain the higher-octane products?

This is a problem even today when the demand for aviation gasolines is so high. Consumption of motor fuels is declining and will drop sharply again when gasoline rationing is introduced on a national scale. There are no storage facilities to handle the vast gallonage of motor fuel which the oil companies will have to keep on producing in order to meet requirements for aviation fuel. About the only answer is to dump the motor fuel and there have been occasions where this has been done. A smarter idea, now reportedly being considered by oil companies, is to pump the excess fuel back into oil wells. This at least represents returning the fuel to its original source and does not appear quite so wasteful as turning it into sewers or dumps.

It may be well to discount predictions of radical innovations in postwar motor cars. Manufacturers know fairly well what they can do with present designs, as far as cost is concerned and in their 40 years of experience they have seen a good many so-called innovations in design go to the wall. Successful advancements can be narrowed down to a handful—the steel body, the balloon tire, the high-compression engine, the hydraulic brake, coil springing, lacquer-type finishes, synchromesh transmissions, shatterproof glass. The rest have been minor refinements and embellishments, with the addition of more gadgets here and there. The fluid coupling and automatic transmission, representing an important improvement, still can be considered in the development stage, not having reached universal application or complete perfection.

It seems certain that steel is going to continue as the basic material for motor car construction. Obviously the light metals are going to be available in unprecedented quantities and at prices well below even their present level; but the manufacturing problem and the design problem will continue to be important obstacles. Present type of riveted or welded construction used on airplane fuselages will never be practical on automobiles because they are far too costly and suffer from an appearance standpoint.

Aluminum in fact has already been tried for automobile bodies, this being one project which the Aluminum Co. of America conceded was unfeasible. True, more experimentation may overcome previous objections, but who is going to underwrite the experiments when a perfectly suitable material is available in the form of steel?

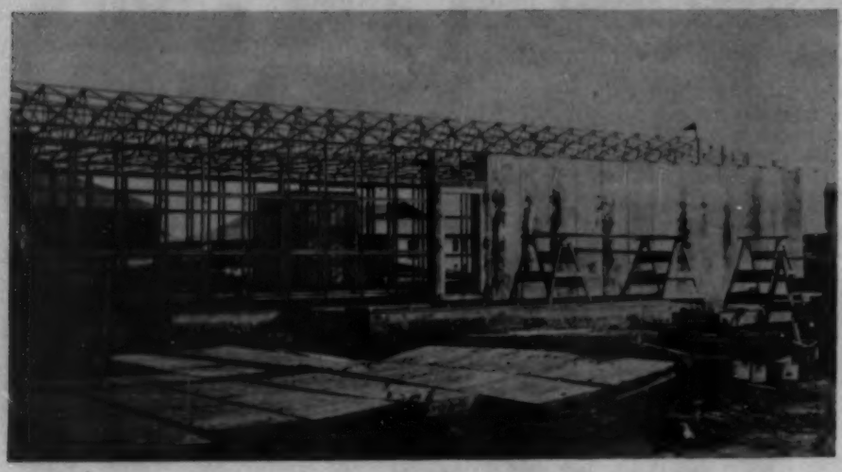
With basic designs of motor cars not deviating too far from present concepts, the question then is what direction changes and improvements will take. Likely the first important improvement will be in transmissions. This trend has started with Chrysler's fluid drive and the Olds hydramatic transmission; but these are only a few steps in the direction of what will ultimately be developed —the completely automatic and infinitely variable ratio transmission. A promising device which accomplishes this which has had some application on buses is the hydraulic torque converter. One company now is building this equipment, but it is earmarked exclusively for the armed forces for use on tanks. However, it will be ready for postwar application to automobiles.

Export markets, if there are any left after the ravages of war, should prove a ripe field for motor car manufacturers. Much has been learned about improved methods of crating and shipping military equipment abroad, and this knowledge should be readily translatable into sending knocked-down automobiles to foreign buyers. Furthermore the possibilities of air shipment of export goods are tremendous. The Army Air Forces, with the co-operation of operators of commercial air transport lines, have set up a veritable world-wide system of air freight and this network of supply lines will prove a boon to export shippers when peace comes.

Refrigerators for Distant Air Bases

Airtemp Division of Chrysler Corp., working in co-operation with engineers of Pan American Airways, the Shear & Turner Engineering Co. of Boston and the Lindsay Structure Division of the Dry-Zero Corp., Chicago, has made a notable contribution to the establishment of 'round-the-world bases for pilots and crews of these air cargo haulers. Special types of refrigerator buildings 78 feet long, 21 feet wide and 8½ feet high, have been designed to be shipped knocked-down by air to bases in tropical jungles where they can be set up by native labor working under company supervision.

The structures are equipped with refrigerating units to preserve food supplies in the heat which sometimes rises to 130 degrees in the shade. Buildings are of a prefabricated type, involving a light and steel pre-stressed panel type of construction. Known as the Lindsay structure, the design achieves a high strength-weight ratio by placing 26-gage steel panels under tension between framing members, utilizing the strength of the steel panels to eliminate cross braces, gussets and struts. In addition, the accurately die-formed structure can be assembled quickly with simple wrenches, no welding or riveting being necessary. Likewise, disassembly is just as simple, permitting the buildings to be moved about and reassembled as desired. Inner wall panels carry the hermetically sealed



Seventy-eight foot refrigerator building under construction at one of Pan American Airways tropical bases. Buildings were shipped knocked-down and assembled in out-of-the-way locations by unskilled natives in three weeks each

compressor and refrigerating equipment, all piped and wired before shipment. The inner wall is set 8 inches away from the outer structural panel, with the space filled with insulation material. Roofs and floors are similarly insulated. The buildings are partitioned for various food storage conditions with temperatures ranging from 0 to 40 degrees Fahr. Fifteen unskilled natives and one Pan American supervisor have been able to erect one of the buildings in about three weeks.

War-Time Expansion in Automotive Industry

Automotive Council for War Production reports production and employment in the automotive industry now are substantially above the highest level ever attained in peacetime, the industry now producing military equipment at an annual rate of nearly 5½ billion dollars, or 32 per cent ahead of the peak peacetime yearly rate. Payrolls are rising at a rate of about 40,000 per month, and in August the industry was employing approximately 809,000, a figure which is 20 per cent ahead of a year ago and 6 per cent ahead of the industry's previous peak.

New analysis of major armament contracts shows that seven companies are building aircraft engines in volume and two others are preparing to build them; nine companies are in production on fuselage subassemblies for airplanes; and four are manufacturing propellers. In addition, five companies hold contracts to produce complete aircraft of various types, and two of these companies have just about completed tooling work.

Military vehicles are being produced by 29 companies; seven are making combat cars, half-tracs, tank destroyers and other armored vehicles. Eight companies are building tanks—medium, amphibian, light and special-purpose—with one plant alone turning out as many units as are produced outside the automotive industry.

Marine engines of several types and sizes are in volume output in six automotive plants, one plant alone supplying more than half of Navy requirements.

Artillery, including aircraft and antiaircraft guns, tank and antitank cannons, field pieces, etc., is pouring from the plants of seven motor companies, while the eighth has nearly completed tooling. Gun carriages are being built by eight companies, and the same number of plants is turning out small arms. This survey covers some 772 motor vehicle, body, parts, tool and die plants.

Steady movement of war material from manufacturers' plants to embarkation points has thrown heavy load on railroad equipment, particularly flat-bottom gondola cars which are used to transport most crated products. Resultant shortage of these cars for other needs, such as movement of foundry sand, has meant that box cars or hopper cars will have to be used where formerly the flat-bottom cars were in service. It is difficult to remove bulk materials like sand from hopper cars where the material must be taken out by bucket or shovel, and not all plants are equipped to receive sand by dumping from the car. Furthermore box cars take a higher freight rate, despite voluble protests from shippers.

GRAHAM-PAIGE BUILDING "ALLIGATOR" TANKS

AMONG weapons adapted to production in existing automotive plants is this amphibian tank shown during a test run on Lake St. Clair. Built by Graham-Paige Motors Corp., Detroit, the heavily armored vehicle is powered by an automobile engine which drives it twice as fast on land as on water. Known variously as the "Alligator," "Invasion Taxi" and "Jungle Jalopy," its effectiveness is reported to have been demonstrated in the Solomon Islands

Modern ELWELL-PARKER *Trucks and Cranes*

AVAILABLE IN STANDARD TYPES AND SIZES

LIFT TRUCKS

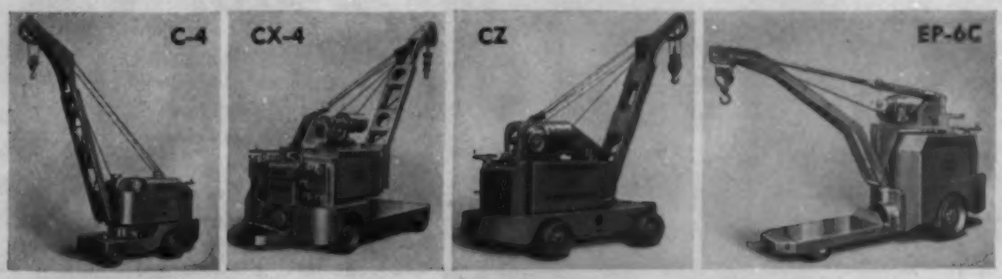
Type	Capacity	Overall Length	Overall Width	Platform Size Length	Platform Size Width	Height at Low Position	Lifts	Turns Intersecting Aisles	Approximate Weight with Power Unit
EQ-4	4,000 lbs.	87¼″	31¼″	41″	18½″	7″	3¼″	50″	2,900 lbs.
EP-4	4,000 lbs.	112½″	38″	54″	26½″	10½″	6″	64″	4,100 lbs.
EP-6	6,000 lbs.	119½″	42¾″	54″	26½″	10¾″	5¾″	69″	4,900 lbs.
GEP-6 (Gas)	6,000 lbs.	125⅜″	42″	54″	26½″	10¾″	5¾″	72″	4,050 lbs.
EP-10	10,000 lbs.	129″	42¾″	60″	26½″	11″	5¾″	71″	5,500 lbs.

TIERING TRUCKS

Type	Capacity	Overall Length	Overall Width	Platform Size Length	Platform Size Width	Height at Low Position	Height Overall	Lift	Turns Intersecting Aisles	Approximate Weight with Power Unit
ELN-6T	6,000 lbs.	129⅞₁₆″	42¾″	54″	27″	11⅛″	83″	113″	70½″	7,000 lbs.
ELN-6	6,000 lbs.	126″	42¾″	54″	27″	11⅛″	83″	62″	69″	6,300 lbs.
ELN-10	10,000 lbs.	137½″	43″	60″	27″	11″	95″	69½″	76″	7,500 lbs.

FORK TRUCKS

Type	Capacity Up to	Long Load	Overall Length 36″ Forks	Overall Width 36″ Forks	Telescoping Truck Lifts Up to	Height, Uprights Collapsed	Turns Intersecting Aisles	Approximate Weight with Power Unit
F-19T	6,000 lbs.	60″	123″	46″	117″	83″	76″	12,200 lbs.
F-25T	10,000 lbs.	48″	141″	51½″	100″	83″	86″	15,500 lbs.
F-23T	5,000 lbs.	42″	118¼″	41″	117″	83″	70″	9,300 lbs.



CRANES

Type	Capacity Lbs.	Capacity @	Overall Length	Overall Width	Boom	Slews	Platform Size Length	Platform Size Width	Platform Size Height	Turns Intersecting Aisles	Approximate Weight with Power Unit
C-4	3,000 lbs.	7′	107¾″	50″	12′-19′	292°	15″	41″	17¼″	69″	10,800 lbs.
CX-4	6,000 lbs.	7′	134¾″	63″	12′-19′	204°	40⅝″	63″	16⅜″	94″	13,400 lbs.
CZ	10,000 lbs.	5½′	132⅛″	64½″	12′-19′	296°	28¾″	50″	25¼″	88″	18,000 lbs.
EP-6C	2,000 lbs.	3½′	129⅛″	42¾″	5′-8′	180°	26½″	54″	10¾″	70″	7,000 lbs.

(Boom mounted on EP-6 Lift Truck)

Elwell-Parker concentrates on these basic types, to give you deliveries of Trucks and Cranes that will meet your scheduled requirements, saving or multiplying manpower to handle your War Loads. Ask Elwell-Parker Engineers to survey your Plant.

The Elwell-Parker Electric Company, 4501 St. Clair Ave., Cleveland, Ohio.

ELWELL-PARKER *Power Industrial* TRUCKS

ESTABLISHED 1893 • BUILDING POWER INDUSTRIAL TRUCKS SINCE 1906

WING TIPS

Ideas for improvements in shop practice rolling into aircraft manufacturers by thousands, slashing time and costs. . . . Rushing spare parts. . . . 400 design changes in latest Flying Fortress

BECAUSE it is a comparative newcomer to the field of mass production, aircraft manufacturing offers exceptional opportunities for the introduction of new ideas and time-saving "shop kinks". Throughout the industry, an outpouring of ideas by men and women at work has developed principally from the stimulating effect of war production drives which most plants have launched in co-operation with the WPB.

Suggestions by the thousands are being examined regularly and are introduced in plant operations as fast as they can be adapted. Savings in cost and time are being realized which could not be bought for any price in peacetime production, and the net effect may be that the aircraft industry will "come of age" long before its normal expectancy because of this forced-feeding of war vitamins in the form of employe suggestions for improving production methods.

A quick look at some of the specific plants is of interest. An employe at Douglas Aircraft, observing the four hours of work involved in painting walkway stripes on topsides of wings, developed a grooved roller with an attached paint reservoir which completed the job in 20 minutes and did away with the former procedure of masking the area adjacent to the 142 feet of striping and then spray painting the stripe. And the new striper costs only $10.

Two other Douglas employes went to work on an overhead drill that was giving a lot of trouble in the form of excessive drill breakage resulting from new operators' improper handling of the equipment. The inventors removed the human element altogether from the drill by fitting a regulator to it which controls the drill pressure automatically at a present level. In revising the pressure control, they eliminated two Logan valves, two vertical check valves, one horizontal check valve, four solenoid valves, six microswitches, one air gage and several pipe fittings. As now set up, the machine drills three holes to the former one, completing 24,000 holes daily in Flying Fortress wing spars.

Two small castings, a spring and three pins were involved in the assembly of stretcher-holder attachments for a Douglas cargo ship. Fitting them together took time, taxed assemblers' patience. So an ingenious employe worked out a combination squeezer tool attachment and jig for holding small parts together until attaching pins could be squeezed and their ends spread. His suggestion saves 20 minutes per part and there are 26 parts per ship.

Still another keen-thinking employe, noting the frequent buckling and tearing of dural sheets after being struck in the lead-zinc dies of a forging hammer, conceived the idea of making the mating hold-down edges wavy instead of flat, giving greater hold-down area. This simple kink licked the tearing problem —and netted its progenitor $100 in war stamps as well.

Many Other Awards

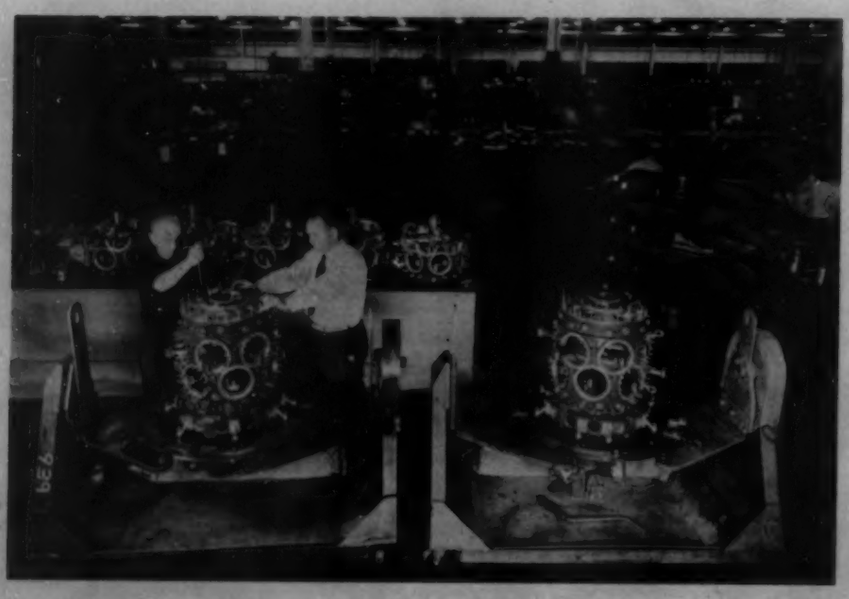
Hundreds of other awards have been made to Douglas employes who are continuing to send in a flood of suggestions. Reading down a list of awards and the suggestions which earned them, the following devices are just a few of those mentioned: Burring tool guard; simplified uncoupling device; metal shield for painting windows; adjustable plate for filing bevels; clamp for spotwelding nut plates; adjustable drill jig; height lock for vertical cam follower for spar cap mill; combination spirit level and indicator; fixed gun bore sight; use of kerosene on hydropress form blocks; screen for air vent on motors; adjustable stop for air router motor; die holding spring for smoothing hammers; power rasp for wood, kirksite or plaster; and a spring steel quick-change rivet set retainer, which saves 3 pounds of rubber bands per shift!

No one airplane company has a corner on shop suggestions. Skip across the country to the Glenn L. Martin plant on the East Coast where employes are feeding in shop suggestions to win cash awards and membership in a new legion of honor which has been dubbed the Order of the Purple Martin. Hundreds already have been given awards for their ideas.

A sheet metal worker, observing that he had to use three separate portable drills to sink one hole in a certain part, sat down and designed a special tool which forms the hole in a single operation. Another workman devised a battery of machines to segregate usable parts such as rivets from floor sweepings and to return them to production. A third devised a special tool to permit slipping rubber tires on rims of beaching and landing gears without damage to rubber or rims. Another built a riveting hammer with a flexible peen to facilitate driving rivets in cramped quarters. Another worked out a simple device which prints and applies identification tape to tubing and small parts.

A power operated cleaning brush that

"COMPOSITE" TESTS PROVE INTERCHANGEABILITY



TWO "composite" Pratt & Whitney aircraft engines with half the parts built by P. & W. at East Hartford, Conn., and half by Chevrolet Motor Co. under license, move down the final assembly in an interchangeability test, which was successfully passed. Ford and Buick parts passed similar tests

SHAFTS OR SHELLS — *Faster!*

SUNOCO EMULSIFYING CUTTING OIL

helps machine better war materials... in shorter time

Whether it's shafts or shells, axles or "ack acks," Sunoco Emulsifying Cutting Oil is proving a production stimulant for all machining operations requiring an emulsifiable cutting oil.

Sunoco is increasing tool life. Exceptionally high heat-absorbing properties preserve the cutting edge of tools . . . permitting longer operating periods between tool grinds, fewer "time outs" for tool changes — more production per shift.

Sunoco is making possible greater feeds and speeds. Because of the excellent heat dissipation, increased speeds and feeds can be utilized on many operations . . . producing more pieces in shorter time . . . with no sacrifice in accuracy or finish.

Sunoco is reducing rejects. Maintenance of close tolerances, smoother finishes, fewer tool set-ups . . . all combine to cut rejects to a minimum.

Sun Doctors of Industry — experienced metal-working experts — are ready, willing and able to show you how Sunoco can speed your war production. Call one in today. For examples of how they are helping others, get your copy of "Helping Industry Help America." Write

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SUN PETROLEUM PRODUCTS HELPING INDUSTRY HELP AMERICA

LET'S GO! U.S.A. KEEP 'EM FLYING!

ERFORMANCE DATA

PERATION—Machi-
g coupling from steel
rging @ 98 R.P.M.

ACHINE — 2-L Gis-
lt Turret Lathe.

OLERANCE — .001".

UTTING LUBRICANT
-1 part Sunoco to 15
rts water.

cleans hulls of flying boats preparatory to painting was the brainchild of a Martin production soldier and it yielded a 40 per cent reduction in cleaning time. A new locating tool for spot welding stiffeners on pilot seats now means three seats produced in the time two formerly required. A rotary file and guide has eliminated hand filing of aluminum skin and effected savings of thousands of man-hours. A new safety lock for crane controllers has anticipated the possibility of crane accidents and removed a potential hazard.

Need for Spares Grows

The problem of keeping the Air Forces supplied with spare parts is no small task and manufacturers have been obliged to organize complete departments devoting their full time to spare parts scheduling, production and shipment. This activity at Bell Aircraft Corp., Buffalo, N. Y., is in charge of R. Wilkins, M. E. Roe, Ted Haertel and Ray Hoemke, and a large staff.

Parts supply is carried out through the co-operative efforts of the Materiel Division of the Army Air Forces at Wright Field and the contract and production control divisions at Bell. Orders for service parts are negotiated with the government by the contracts division and are divided into three classifications: Initial order contracts, regular stock orders and emergency orders.

When new planes are ordered, provision is made for shipment of an initial quota of parts to reach the same destination at the same time. Selection of parts and their quantities are decided upon in joint session between an Air Force "spares selection team" and the Bell contract division, assisted by engineers, service experts and estimators from the contractor's plant. Included in initial orders are everything from bolts and nuts to wing and fuselage assemblies, with such other parts as are required to stock the major depots and provide for replacement requirements during the first few months that the plane is in service.

Supplementing initial orders, additional spare parts are also required by the Air Forces to maintain their regular stocks. These are established at control depots, which are Air Force distribution points, and at supply bases or subdepots behind the lines and at the fighting fronts. As more planes go into service on wider fronts the demand for such parts mushrooms.

Most urgent of all demands—emergency orders—are being requisitioned daily by telephone and telegraph from the material division at Dayton, O. Nothing can stand in the way of these rush orders, preference being given to completion and shipment of most vitally needed parts.

When an order is received by the Bell spare parts organization it must first be checked with the engineering department for nomenclature, accuracy of part numbers and for insurance that it is of current design. Next it must be checked with the planning engineers to see that it can be produced by the plant and installed in the field. Then price must be obtained from the estimating department, and a shipping date from production control. Finally arrangements must be made with production control for scheduling and shipping. Watch must be kept over other details such as segregating materials and crating.

Speeding up hardness testing of bomber parts at Brewster Aeronautical Corp. has been effected by the use of a comparator in connection with a Rockwell tester, with foot control of the former leaving both hands of the operator free to handle parts. Comparator comprises a table-mounted yoke supporting a penetrator placed over an anvil. Die end of the penetrator is the same size as that used in the Rockwell instrument. The anvil moves upward against the penetrator under air pressure of 100 pounds per square inch. Depth of indentation is shown by a dial indicator, which is calibrated against a Rockwell gage, with one segment or "reject area" painted red to facilitate quick reading by women operators

Propeller Plant Workers Devise Means To Utilize Tools to Utmost

Demand for more and more airplane propellers was a signal and a warning to production men at Hamilton Standard Propellers division of United Aircraft Corp., East Hartford, Conn., that all available machine tools must be operated to their utmost, and that short cuts must be worked out.

Certain types of machine tools were found to be carrying much heavier loads than others. Therefore, an immediate need was to adapt operations wherever possible to other and less scarce machine tools, or to make one "critical" machine to do the work of two or more.

An example of this type of planning was the adaption of a Morton keyseater to do work which had been tying up a Pratt & Whitney vertical shaping machine with a rotary table which was needed on other and larger work. The operation was the generation of a hex for wrench adjustment into the piston which serves as a combination piston and propeller retaining nut on all controllable pitch propellers.

The Morton keyseater, as shown by Fig. 1, opposite page, was converted into an automatic machine for this operation by use of special fixtures. A Geneva motion with a cam arrangement was utilized, feed being obtained from the cam and divisions from the Geneva mechanism. The setup eliminated the need for a highly skilled operator, conserved floor space, provided an 80 per cent saving in labor and increased production 40 per cent.

Smooth finish of parts under stress loads, such as the spider which positions the blades, is a "must" in propeller manufacture. For instance, the arms of the spider, whether for a two, three or four-blade propeller, are bored through the center to cut down weight. All these bores must be polished.

To free for other use a turret lathe which was used on this job, production tion men of Hamilton Standard and Cheney Bros., designed the special eccentric polishing head illustrated in Fig. 2. Eccentricity is obtained by means of cams. Incorporation of a work holder and a feed mechanism made the machine semiautomatic and a special bob was designed to form the radii at the bottom of the arm bore.

The operator simply clamps the work in the holding fixture, starts the ma-

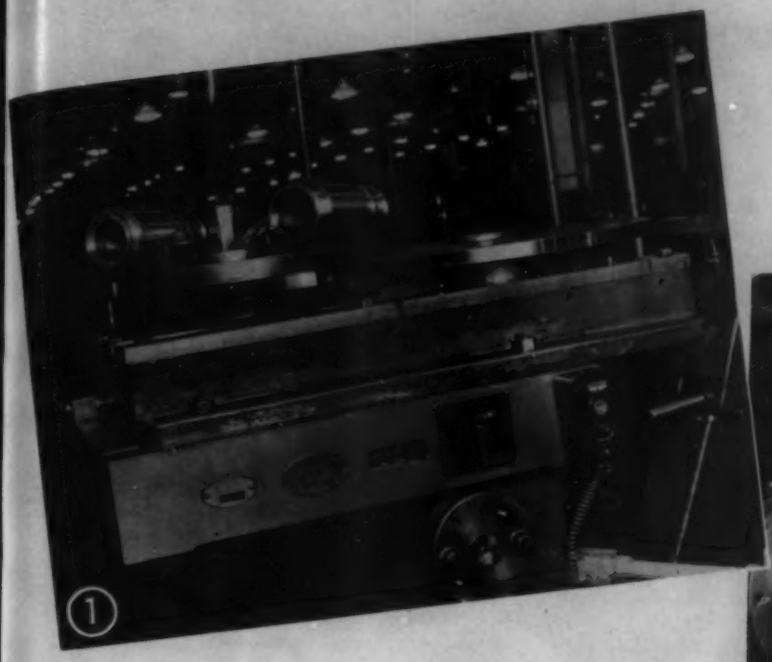

Fig. 1—By fitting this Morton keyseater with Geneva indexing mechanism and cam feed, it was converted into an automatic "hexing" machine, thus releasing a Pratt & Whitney vertical shaper which was needed on other work of larger size

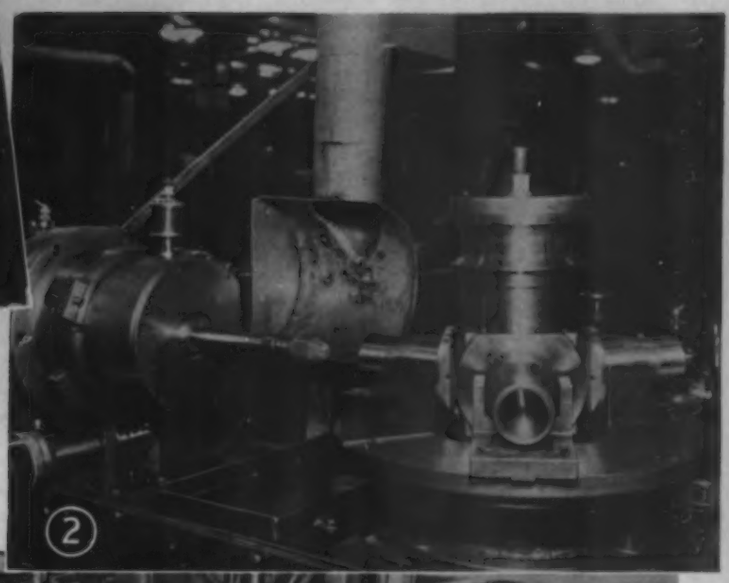

Fig. 2—Job of precision finishing these holes in propeller spider arms formerly tied up a turret lathe. Now this eccentric grinder fitted up with special indexing and work-holding device does the job in one-third the time

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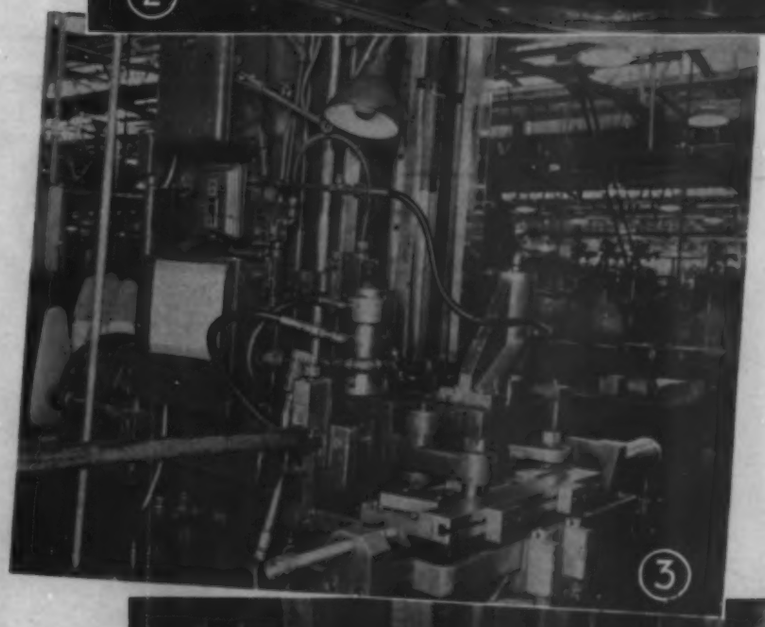

Fig. 3—This is the "incoming side" of a Lapointe broaching machine tooled up for making out of standard rectangular barstock, U-shaped retainers which previously required special extruded stock and a precision grinding operation

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Fig. 4—Here we see the "outgoing side" of the same machine shown in Fig. 3. Note successive steps of notching, rounding and cutting-off, through which three finished retainers are dropped off at each stroke of the multitooled ram

chine and throws in the feed, whereupon the eccentric spindle continues to operate until a stop terminates the operation. Following withdrawal of the spindle the work table is indexed and the same procedure is repeated for each arm. The entire operation of polishing armbores and radii is thus performed in less than one-third the time formerly required.

Hydromatic propellers require a large quantity of spring pack retainers, 16 being provided for each blade. These small U-shaped parts hold the springs which provide the drive between gear segment and propeller blade for changing pitch. They are in effect shock absorbers for this drive mechanism.

Originally, especially formed extruded bar stock was used. This was first

(*Please turn to Page* 105)

Shipbuilding Program Expanded; Dominion Making Own Magnesium

TORONTO, ONT.

SHIPBUILDING activity in the Dominion has been extended until the program includes expenditures of $750,000,000, an increase of more than 50 per cent over the value of contracts placed to the end of 1941. C. D. Howe, minister of munitions and supply, has announced that contracts have been awarded for nearly 300 cargo ships of 10,000 tons capacity, at cost of about $600,000,000. A number of these craft have been launched and delivered.

Since the outbreak of the war Canadian yards have launched more than 200 combat ships, including corvettes, minesweepers, patrol boats, base ships and other vessels. Keels are being laid for two destroyers. Some 1000 smaller craft, ranging from lifeboats to motor torpedo boats, have been launched and 1500 more are under construction. Shipbuilding branch of the Department of Munitions and Supply has purchased 50 yachts and motor boats and 20 smaller craft have been chartered.

Shipbuilding is under way in 21 major shipyards and 58 smaller yards on the east and west coasts, the St. Lawrence and the Great Lakes. Personnel has increased to 40,000 workers. Under direction of a controller of ship repairs and salvage, extensive facilities for repair have been provided at cost of about $6,000,000. These include a floating dry dock, additional docking space, new machine shop buildings and tools for repair work.

In the construction of one corvette ten miles of pipe and tubing are used, 14 tons of anchor chain, 38 tons copper wire, 600 electric light bulbs, nearly 1500 bronze valves weighing from less than half a pound to more 700 pounds and 1000 tons of steel shapes and plates in the hull.

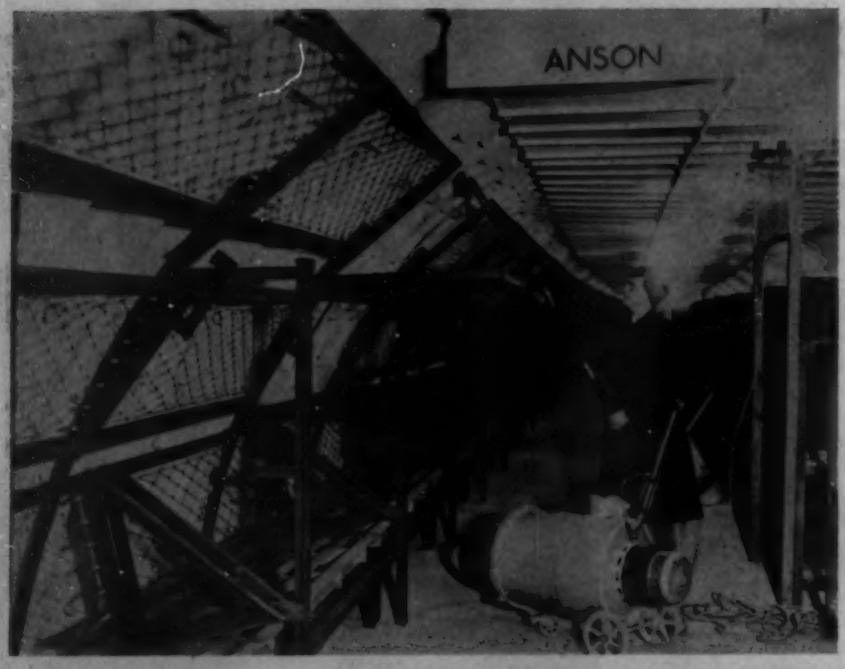
The new government-owned plant of Dominion Magnesium Co. at Haleys Corners, near Renfrew, has been placed in operation and Canadian magnesium now is available for the first time. Until now Canada's entire supply has been imported from the United States. When demand became acute for flares, night bombs, shell fittings and pyrotechnics the metals controller and National Research Council devised new production methods. Research workers in Canada and the United States developed a thermal process for extracting metallic magnesium from dolomite, of which there are large deposits in Ontario.

Wartime Metals Corp., a government-owned company, was formed to supervise production and Dominion Magnesium Co. was incorporated as a private concern to build and operate the $5,000,000 plant without profit. Entire output will be used for war purposes and new units will be added at once.

J. H. Berry, motor vehicle controller, has issued an order limiting production of clutches, axles and other essential passenger car and light truck replacement parts to 70 per cent of the quantity made in the corresponding three months of 1941. The order permits manufacture of replacement parts for heavy trucks, buses and truck trailers, under a quota set at 125 per cent of 1941 production. Distributors' inventories in eastern Canada have been restricted to 60 days' supply but in western Canada, remote from manufacturing centers, 90 days' supply is allowed. Used parts must be returned in exchange for new, to be used for scrap.

All-out war production, with strikes and industrial disturbances postponed for the duration, was the keynote at the annual convention of the Canadian Congress of Labor. Labor Minister Mitchell and A. R. Mosher, president of the Congress, emphasized the necessity for maintaining constant production for the war effort.

LONDON BUILDS "TOWNS" 100 FEET UNDERGROUND



LONDON: One hundred feet underground and capable of housing over 8000 persons, this gigantic new London bomb shelter contains complete eating, sleeping and medical quarters. A battle could rage above it, without harming its inhabitants, away from bombs, gas and shells. Eight of these towns are to be built beneath cities, four north and four south of the Thames and will be converted for underground railway systems after the war. Here one of the attendants is cleaning folding bunks which when pushed back give clear space for workers. NEA photo

Palladium Replaces Platinum In British Jewelry Trade

Palladium alloys are finding increasing use in England in the jewelry trade as substitutes for the more expensive and less easily obtainable platinum alloys, according to unofficial reports to Washington.

Palladium is similar in general appearance and in other characteristics to platinum and is hardened by the addition of ruthenium, another member of the platinum metals group. These palladium-ruthenium alloys are being used to replace iridium-platinum alloys, which are required for vital war purposes. The price of palladium is reported to have remained unchanged.

R. R. Nathan, left, chairman of WPB's planning committee, inspects differential pinions made by new Timken process that "speeds production and will save a million pounds of high-grade steel this year at the current production rate." At right, explaining the process, is Willard F. Rockwell, board chairman of Timken-Detroit Axle Co. Mr. Rockwell is now serving as director of production for the United States Maritime Commission

Forged Pinion Saves Tons of Steel

"MAKING more—faster—from less, is a stiff challenge to American industry, but production men can be depended upon to come up with the answers," said Willard F. Rockwell, board chairman, Timken-Detroit Axle Co., in a recent discussion of the steel situation. As an example of how steel can be saved, he described a new Timken process for making differential pinions, a small but important part of every military truck axle.

"Thanks to this new process, we are now making more differential pinions per day—are making them faster—and at the same time will save about 1,000,000 pounds of high-grade steel this year at the current production rate.

"These differential pinions have a special tooth form developed by Timken for the United States Army and require special gear cutting machines. Every driving axle requires four of these differential pinions and because nearly all Army trucks use three driving axles, 12 differential pinions per truck are required. With the tremendous volume of military trucks now being manufactured, we did not have sufficient gear cutting capacity to meet 24-hour per day production requirements.

"We turned to our forging division, and out of it all came a process for forging pinion teeth to the same finished dimensions and with the same accuracy as obtained from the gear cutting.

"We used to machine the smallest differential pinion from a piece of steel bar weighing 1.65 pounds. We now forge this pinion with the teeth forged to the accurate finished dimension, from a steel forging billet weighing 0.92 pounds, a steel saving of 44 per cent.

"On a larger differential pinion, we forge from 2.12 pounds of steel instead of machining from a piece of steel bar weighing 4.77 pounds, showing a saving of 55 per cent."

New Containers Conserving Tin

Creation of new types of containers to meet the conditions of war has been one of the more important, if little publicized packaging developments which have taken place in the last year and a half. Process of change is continuous.

The containers industries are highly specialized, and, as a result, have not been able to convert their facilities to the production of a large volume of direct war items. "Conversion" in the containers industries, has meant instead, the invention of new types, and adaptations of old types, to meet the peculiar requirements of war.

The steel shipping container industry, for instance, has turned out an American version of the "blitz" can—a multi-purpose 5-gallon can which is used by the armed forces for carrying all sorts of liquids. This container can be used for water, oil, or gas, and can be carried by one or two soldiers. Although made of heavy steel, the cans are designed to float even when full.

Fibre can manufacturers have developed a shell container, a spiral wound tube with metal ends, which affords maximum protection to all sizes of shells from the time they are made until they are used.

Diversity of Products

Diversity of the products which are needed by the armed forces indicates that there are few containers which do not have some degree of essentiality.

Containers are necessary to help maintain not only the man behind the gun but the man on the production front as well. Tin cans, for instance, are being used to pack fruits and vegetables going to the Army, to civilians, and to Lend-Lease; containers are being produced to hold evaporated milk and other essential subsistence items; ration cans for distribution to soldiers are being produced by the million; for each antiaircraft or other shell requiring a fuse or motor, one hermetic seal must be produced; containers must be provided for the vital blood plasma for the Army and the Red Cross.

The collapsible tube industry is producing tin and lead tubes for burn ointments, medicinal products, and of course, shaving cream and toothpaste.

Steel barrel and pail industries are making twice as many containers this year as in normal years. About 75 per cent of the total is going directly to the armed forces, while the need for the remaining 25 per cent can be traced indirectly to the war effort.

Among the steel containers going directly to war are those for oil and grease for tanks and airplanes, as well as for some food items such as shortenings. The indirect war items include paints, petroleum products, and fuel for productive machinery. The tight cooperage industry is also making a substantial contribution to the number of containers provided for those purposes.

Some of the large container companies have converted their machine shops to production of such items as gun mounts, breech blocks and shellmaking machines.

ARMY-NAVY AWARDS

Fig. 1—Following award of the "E" to the Struthers Wells Titusville Corp., Titusville, Pa., President J. T. Dillon Jr. conducted the service officers on an inspection tour of the plant. Left to right: Lieut. Col. A. F. Witte, executive officer, Cleveland Ordnance District; Comm. R. G. Walling, resident inspector of Naval materiel; Mr. Dillon; Comm. R. G. Lowry, British Navy

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Fig. 2—Admiral Emory S. Land presents Labor Merit Insignia to oldest workers in each department on the occasion of presentation of the Maritime Commission "M" to Combustion Engineering Co. Inc., Hedges-Walsh-Weidner Division, Chattanooga, Tenn. Colored worker has 48 years of service

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Fig. 3—Lieut Col. Edward H. Bowman, chief of Chicago procurement district, delivers the "E" pennant to George Purdy, president, Greenlee Bros. & Co., Rockford, Ill. Colonel Bowman said: "The Army Air Force congratulates management and craftsmen on excellence in workmanship embodied in the critical machines which you build." Among those to which he had reference are huge "transfer machines" which are playing an important role in mechanized production of aircraft engines

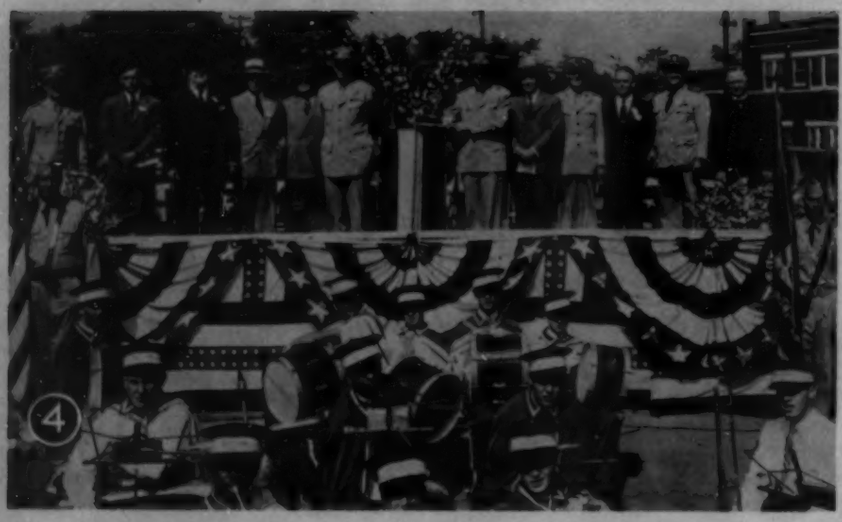

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Fig. 4—Omaha Steel Works, Omaha, Nebr., received the burgee Sept. 9. Shown are participants in the ceremony, including Army and Navy officers, company executives and civic officials. In foreground are members of the Father Flanagan's Boys Town band

Republic's Valley Plants Win Flags

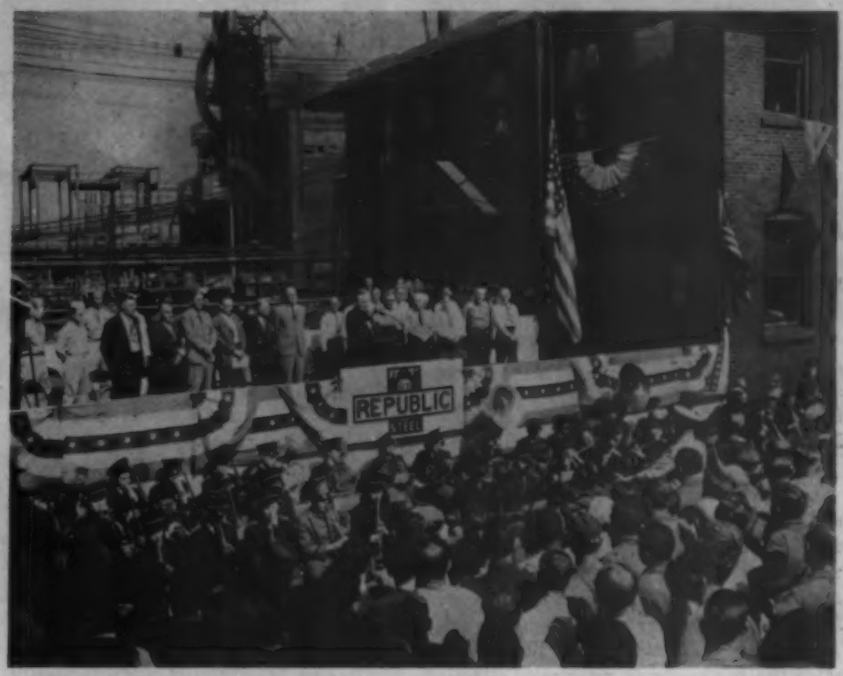
Cited for records in bonds and production; veterans participate in ceremonies; Sons in Service

TWELVE veterans of World War I or fathers of sons now in service, representing as many departments, were chosen to raise the Treasury's "minute man" flag over Republic Steel Corp.'s Youngstown works. Flag was awarded after 92 per cent of employes had subscribed to company's payroll deduction plan for the purchase of War Bonds.

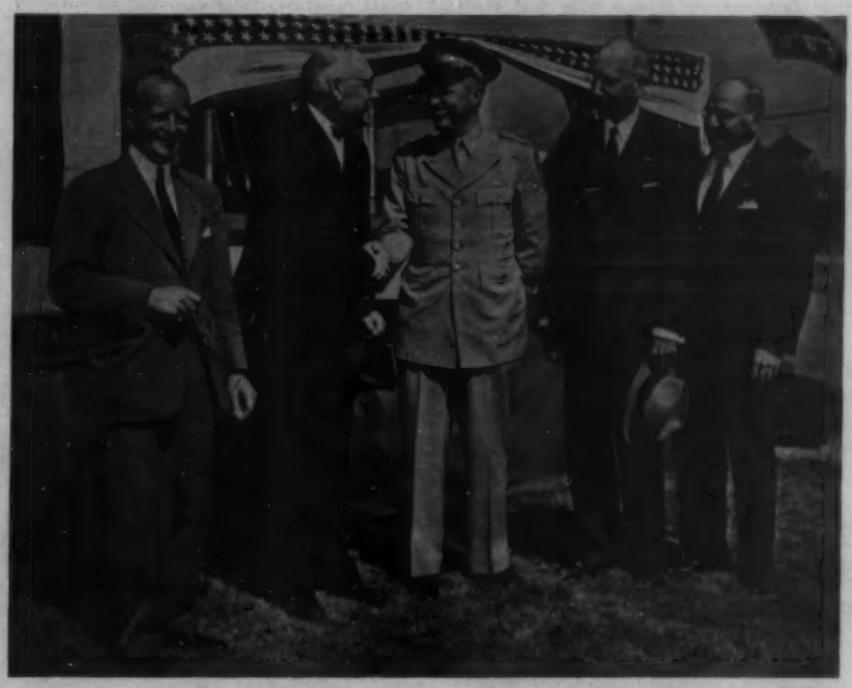
Flag was presented to Roy L. Leventry, district manager, by David E. Jones, chairman of the Youngstown Chamber of Commerce War Bond committee.

Mr. Leventry said the award "is proof that the men of Republic are supporting the war effort with their dollars as well as their work." Since Pearl Harbor, he added, the plant has broken 161 eight-hour production records, 71 twenty-four-hour records, and 33 monthly records.

The "minute man" flag raised over Republic's Dilworth-Porter plant in Pittsburgh last Thursday, bore in the lower right-hand corner an additional "T" emblem, signifying that the employes had subscribed 10 per cent or more of the payroll to the purchase of bonds. Actually the 215 employes, representing 100 per cent participation, have pledged 11.2 per cent of their pay.



Republic Steel Corp.'s Youngstown works receives the Treasury's "minute man" flag for exceeding the 90 per cent War Bond goal. In the background of above photo may be seen the large new blast furnace, built by Defense Plant Corp., which will be put in blast on or about Oct. 1



MAJOR H. R. Battley, Army Air Corps, congratulates L. W. Kemp, manager of the International Smelting & Refining Co.'s Raritan Copper Works, Perth Amboy, N. J., as the plant receives the Treasury "T" for 100 per cent employe participation in the War Bond drive. Left to right: J. A. Ramsey, chairman of the Middlesex county payroll saving committee; Mr. Kemp; Major Battley; Frederick Laist, vice president in charge of metallurgy and E. O. Sowerwine, assistant to the president, both of the Anaconda Copper Mining Co., parent organization

A committee of ten employes, headed by Bert Craig of the bar mill mechanical maintenance department, accepted the flag from C. B. Nash, reresenting the Treasury Department. The ceremony included dedication of a company service flag with 20 stars.

On the platform with the committee were B. F. Handloser, general superintendent of the plant, and two additional employes, John May and Walter Gilbert, each of whom has three sons in the service. They participated in the dedication of the service flag which was presented by Earl M. Richards, assistant vice president in charge of operations

Perfect score in the purchase of War Bonds was celebrated at the Truscon Steel Co. plant, Youngstown, when the "minute man" flag was raised last week. Truscon is a Republic Steel subsidiary.

All of the 2500 employes have signed up for purchase of War Bonds and subscribed for a total of more than 11 per cent of the payroll.

The flag was presented by Mr. Jones and accepted for the employes by W. M. Kelley, Truscon works manager. On the platform with Mr. Kelley and C. B. McGehee, general manager of sales, were more than dozen employes, sons in the armed services.

Peru To Build $15,000,000 Steel Plant with United States Loan

CONTRACT for establishment of a Peruvian steel, iron and coal industry was signed Sept. 4 at Lima, to cost $15,000,000, funds to be provided by the United States. Ministry of Fuels and Public Works of Peru approved and announced the project last week. H. A. Brassert & Co., industrial engineers, of New York, Pittsburgh, Chicago and London, are contractors for the Peruvian government.

Construction cost will be met from a $25,000,000 credit granted to Peru by the Export-Import Bank under an agreement between the two countries signed in April, 1941. The steel, iron and coal investment is self-liquidating and is to be amortized within seven and a half years after the beginning of production. Annual output of 100,000 metric tons of finished iron and steel products is planned.

The Brassert firm is to receive a fee of 7 per cent of the cost, excluding insurance and various other charges, and is to supervise technical operations of each new unit for six months after completion, before turning it over to the Peruvian government. Negotiation of the contract was carried out by Alexander C. Barker, vice president and a director of the Brassert company.

Three main territorial divisions are set up, as follows:

Exploitation of iron mines of the Marcona region, within ten to fifteen kilometers of San Nicolas and San Juan bays and 400 kilometers south of Callao.

Exploiting of coal deposits in the Santa and Chuquicara Valleys, about 110 kilometers inland from the port of Chimbote, which is 350 kilometers north of Callao.

Peru's Largest Development

Installation of a blast furnace and steel producing and finishing mills, docks and transport facilities at the port of Chimbote, which will become the center of the new industry.

This development is the largest industrial program in the modern history of Peru. It is estimated 4000 men will be engaged in construction for two or three years. The completed works and allied industries will give employment to 5000 men.

Iron ore deposits of Marcona lie near the bays of San Nicolas and San Juan, either of which would provide suitable harbor and shipping facilities. The deposits are close to the surface and for the first ten or 15 years at least mining will be by the open-pit method. Drilling operations have proved up reserves of 10,000,000 tons, of which 6,500,000 tons are positive and the remainder probable. Plans call for open-pit mining of 500,000 tons per year for 15 years.

Exportation of iron ore to the west coast of the United States has been considered but probably will not be undertaken for some time, as it may prove more profitable to export pig iron from Chambote than raw ore from Marcona.

Coal Reserves Are Large

So far as known, Peru has the largest coal reserves of any South American country, including coal of high grade which can be exported advantageously and which is suitable for metallurgical purposes. Reserves are estimated at a billion tons, ranging from high-volatile bituminous to anthracite. The bituminous coals are at relatively long distances from seaboard and at present are inaccessible to economical transportation.

Initial development of anthracite production on a large scale for export and for consumption at the iron and steel plant will be at Galgada, on the Chuquicara branch of the railway. A single mine in this area will produce all the coal needed for the initial program, 500,000 tons per year. About 80,000 tons will be needed for the blast furnace and the remainder will be prepared for export.

Of raw materials, other than coal, ore and limestone, manganese is most indispensible and 700 to 1000 tons of 80 per cent ferromanganese must be imported annually.

Organization of a cement industry at Chimbote is under consideration, to utilize the blast furnace slag in production of cement of Portland quality.

One of the principal installations at Chimbote will be a mole, with a deep water dock about 925 meters long. Work on the first section is now under way. The dock is planned to accomodate ore freighters up to 17,500 tons or more. The iron and steel plant proper will include one 300-ton blast furnace; duplex steel plant; Curran-Knowles coke ovens; three-high breakdown mill; sheet bar mill; sheet mills; merchant mill; wire mill, bright and galvanized; factory for bolts, nuts, barbed wire, nails, etc.; cast iron pipe foundry; boiler and power plant.

The rolling mills are designed to roll light sections and rails up to 35 kilograms per meter. Provisions has been made for installation of heavier production units if sufficient demand develops.

This is the second steel plant development in South America for which the United States has made a loan. In September, 1940, the Export-Import bank loaned $20,000,000 to the Brazilian government for this purpose, an additional $25,000,000 to be furnished by Brazilian interests. The loan was to be payable in 20 semi-annual installments, the first to be due in three years from the date of the first advance.

Contract for building a complete steel plant was let in December, 1940, to Arthur G. McKee & Co., Cleveland. It included coke ovens, a 1000-ton blast furnace, open-hearth plant with annual capacity of 350,000 tons, and rolling mills to produce a complete range of products from heavy semi-finished steel, rails and structurals to finished sheets and tin plate. The plant was estimated to cost about $36,000,000, a company capitalized at $45,000,000 being formed. Two and a half to three years was estimated as necessary for completion.

Bolivia and the United States have signed an agreement for a metal production development to cost about $25,000,000. At the request of the Bolivian government an economic mission from the United States is studying stimulation of metals production, particularly by small mines.

Mineral Production in Western China Improves

Since the development of western China began, the government has attempted to promote and encourage mining, according to a report to the Department of Commerce.

A number of new concessions have been granted but these as well as older established operators are hampered by lack of technical personnel, machinery, and transportation facilities.

Production in unoccupied China during 1941 is reported as 11,500 tons of tungsten, 7600 tons of antimony, 7000 tons of fine tin, and 120 tons of mercury. Increases in copper, lead, zinc, and gold were mentioned. The present coal output is estimated at 6,000,000 tons annually.

The 1941 production of foundry iron was 10,000 tons which was hardly sufficient to meet the more important requirements of the country.

One of the important discoveries was the oil fields in northern Kansu, which the Bureau of Mining states produced 3,630,000 gallons of crude oil last year.

Activity Index Climbs To New Peak Level

STEEL's index of industrial activity rebounded sharply from the slight dip recorded during the Labor Day week to reach a new peak of 176.7. This represents a gain of 5.5 points over the holiday week figure, more than recovering the ground lost during that period.

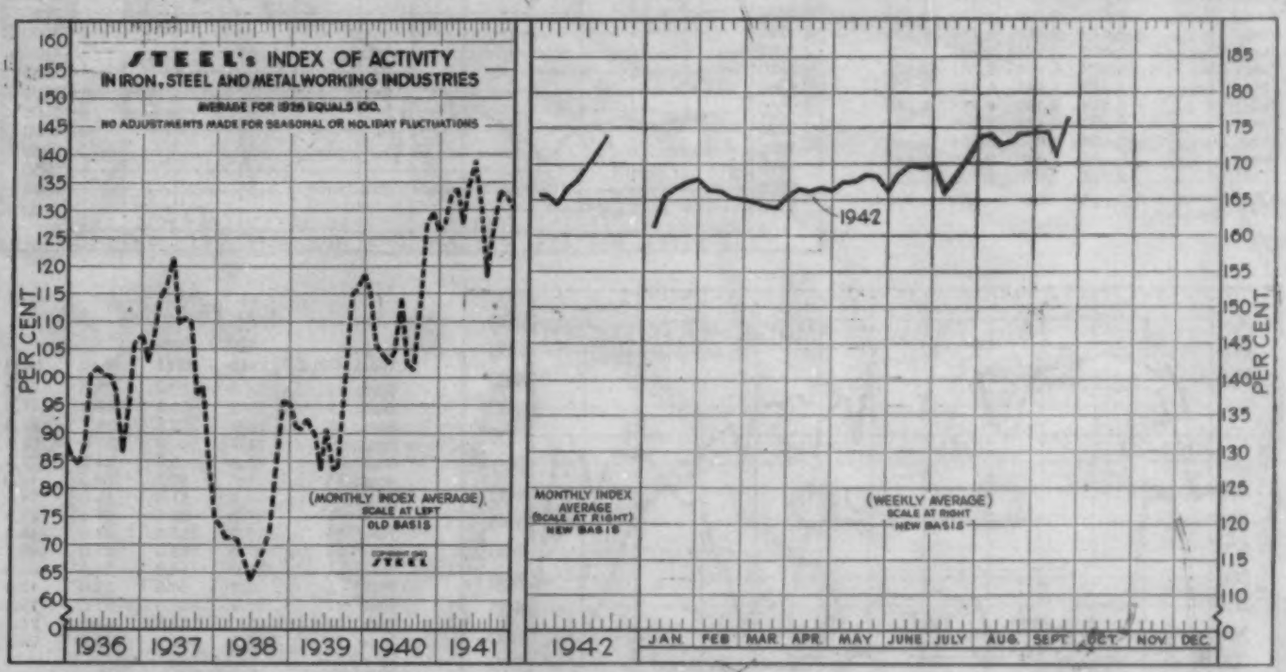
Further expansion in production of military goods has been noted in recent weeks, which accounts for the almost steady upward trend of STEEL's index. Output of machinery, transportation equipment, and nonferrous metals are also showing steady gains.

Growing shortages of materials and manpower in the face of rapidly expanding war needs continues to hamper output of military goods. Longer work-weeks have been instituted in some lines to alleviate the shortage of skilled men.

Electric power consumption rose to a new record high during the week ended Sept. 19. Power output in that period amounted to 3,756,922,000 kilowatts, an increase of 14.8 per cent over that recorded in the like 1941 week. Output for the preceding holiday week has been revised upward slightly to 3,583,408,000 kilowatts.

Railroad freight traffic during the latest period is estimated to have recorded a sharp recovery from the less than seasonal dip registered during Labor Day week.

Steel ingot production has fluctuated only slightly in recent weeks, holding steady at about 98 per cent of capacity. Last year at this time the national steel rate stood at 96 per cent. The spread between current output and that of a year ago is larger than the percentage figures would indicate, due to the steady expansion of production facilities in recent months. Steel scrap collections are somewhat improved, but are only slightly more than sufficient to sustain steel production.

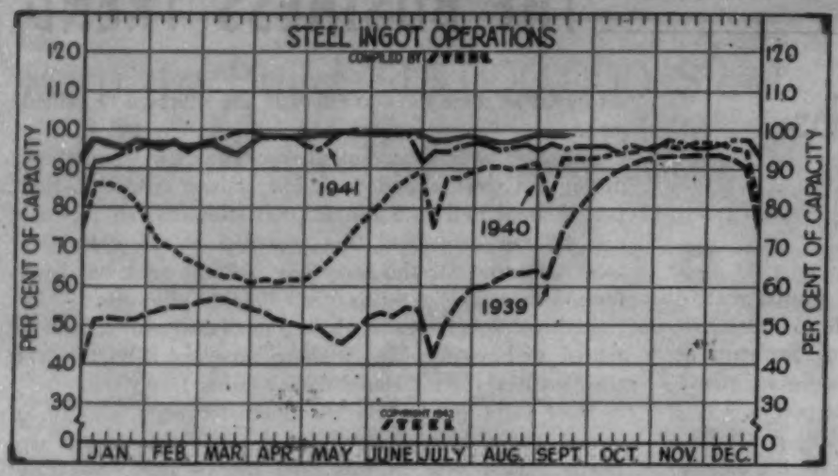


STEEL's index of activity gained 5.5 points to 176.7 in the week ending Sept. 19

Week Ended	1942	1941	Mo. Data	1942	1941	1940	1939	1938	1937	1936	1935	1934	1933	1932	1931
July 18	172.1	133.2	Jan.	165.7	127.3	114.7	91.1	73.3	102.3	85.9	74.2	58.8	48.6	54.6	69.1
July 25	173.6	132.9	Feb.	165.6	132.3	105.8	90.8	71.1	106.8	84.3	82.0	73.9	48.2	55.3	75.8
Aug. 1	173.8	123.3	March	164.6	133.9	104.1	92.6	71.2	114.4	87.7	83.1	78.9	44.5	54.2	80.4
Aug. 8	172.8	117.5	April	166.7	127.2	102.7	89.8	70.8	116.6	100.8	85.0	83.6	52.4	52.8	81.0
Aug. 15	173.3	118.2	May	167.7	134.8	104.6	83.4	67.4	121.7	101.8	81.8	83.7	63.5	54.8	78.8
Aug. 22	174.0	118.5	June	169.4	138.7	114.1	90.9	63.4	109.9	100.3	77.4	80.6	70.3	51.4	72.1
Aug. 29	174.5	118.2	July	171.0	128.7	102.4	83.5	66.2	110.4	100.1	75.3	83.7	77.1	47.1	67.3
Sept. 5	174.8	111.8	Aug.	173.5	118.1	101.1	85.9	68.7	110.0	97.1	76.7	83.0	74.1	45.0	67.4
Sept. 12	171.2	131.3	Sept.	....	126.4	113.5	98.0	72.5	96.5	86.7	89.7	56.9	68.0	46.5	64.3
Sept. 19	176.7†	130.6	Oct.	....	133.1	127.8	114.9	83.6	98.1	94.8	77.0	56.4	60.1	48.4	59.2
			Nov.	....	132.2	129.5	116.2	95.9	84.1	106.4	88.1	54.9	52.8	47.5	54.4
†Preliminary.			Dec.	....	130.2	126.3	118.9	95.1	74.7	107.6	88.2	58.9	54.0	46.2	51.8

Note: Weekly and monthly indexes for 1942 have been adjusted to offset the forced curtailment in automobile production and to more accurately reflect expanding steel production.

THE BUSINESS TREND



Steel Ingot Operations

(Per Cent)

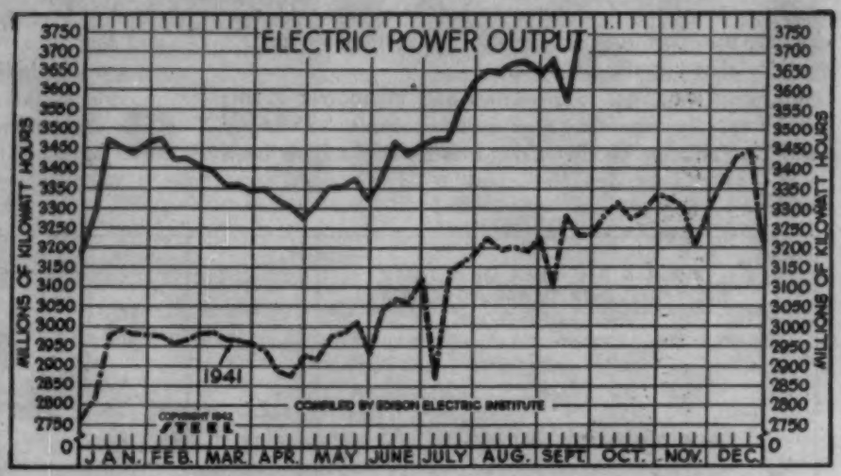
Week ended	1942	1941	1940	1939
Sept. 19	98.0	96.0	93.0	79.5
Sept. 12	98.0	96.5	93.0	74.0
Sept. 5	98.0	93.5	82.0	62.0
Aug. 29	96.0	96.5	91.5	61.0
Aug. 22	97.5	96.0	90.5	63.5
Aug. 15	97.0	95.5	90.0	63.5
Aug. 8	97.5	96.5	90.5	62.0
Aug. 1	98.0	97.5	90.5	60.0
July 25	98.5	96.0	89.5	60.0
July 18	98.0	95.0	88.0	56.5
July 11	97.5	95.0	88.0	50.5
July 4	97.5	92.0	75.0	42.0
June 27	98.5	99.5	89.0	54.0
June 20	99.0	99.0	88.0	54.5
June 13	99.0	99.0	86.0	52.5
June 6	99.0	99.0	81.5	53.5
May 30	99.0	99.0	78.5	52.0

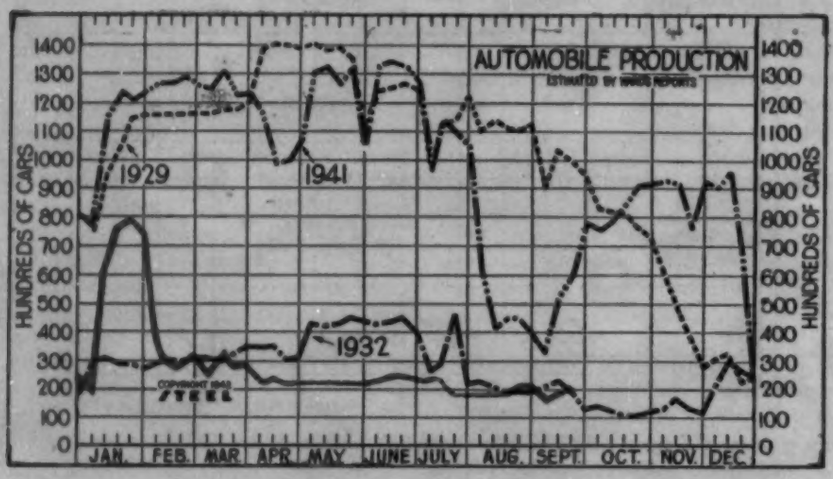
Electric Power Output

(Million KWH)

Week ended	1942	1941	1940	1939
Sept. 19	3,757	3,232	2,769	2,538
Sept. 12	3,571	3,281	2,773	2,532
Sept. 5	3,673	3,096	2,592	2,376
Aug. 29	3,640	3,224	2,736	2,442
Aug. 22	3,674	3,193	2,714	2,434
Aug. 15	3,655	3,201	2,746	2,454
Aug. 8	3,649	3,196	2,743	2,414
Aug. 1	3,649	3,226	2,762	2,400
July 25	3,626	3,184	2,761	2,427
July 18	3,565	3,163	2,681	2,378
July 11	3,429	3,141	2,652	2,403
July 4	3,434	2,867	2,425	2,145
June 27	3,457	3,121	2,660	2,396
June 20	3,434	3,056	2,654	2,362
June 13	3,464	3,066	2,665	2,341
June 6	3,372	3,042	2,599	2,329

†Preliminary.


ELECTRIC POWER OUTPUT
MILLIONS OF KILOWATT HOURS
1941
COMPILED BY EDISON ELECTRIC INSTITUTE
COPYRIGHT 1942 STEEL
J A N. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.



Auto Production

(1000 Units)

Week ended	1942	1941	1940	1939
Sept. 19	21.0	60.6	78.8	54.0
Sept. 12	19.6	53.2	66.6	41.2
Sept. 5	16.9	32.9	39.7	26.9
Aug. 29	21.1	40.0	27.6	25.2
Aug. 22	20.2	45.5	23.7	17.5
Aug. 15	19.2	45.6	20.5	13.0
Aug. 8	19.2	41.8	12.6	24.9
Aug. 1	18.3	62.1	17.4	28.3
July 25	18.3	105.6	34.8	40.6
July 18	17.9	109.9	53.0	47.7
July 11	23.0	114.3	65.2	61.6
July 4	22.7	96.5	52.0	42.8
June 27	22.9	127.9	87.6	70.7
June 20	23.2	133.6	90.1	81.1
June 13	22.3	134.7	93.6	78.3

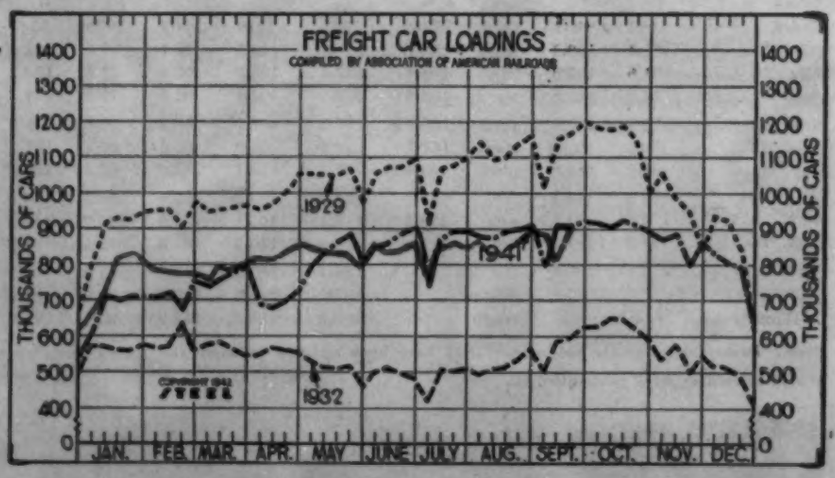
Figures since Feb. 21 last include Canadian trucks and automobiles and United States trucks.

Freight Car Loadings

(1000 Cars)

Week ended	1942	1941	1940	1939
Sept. 19	900†	908	818	815
Sept. 12	815	914	804	806
Sept. 5	888	798	695	667
Aug. 29	899	913	769	722
Aug. 22	869	900	761	689
Aug. 15	869	890	743	674
Aug. 8	850	879	727	685
Aug. 1	864	883	718	661
July 25	856	897	718	660
July 18	857	899	730	656
July 11	853	876	740	674
July 4	759	741	637	559
June 27	853	909	752	660
June 20	840	880	725	643

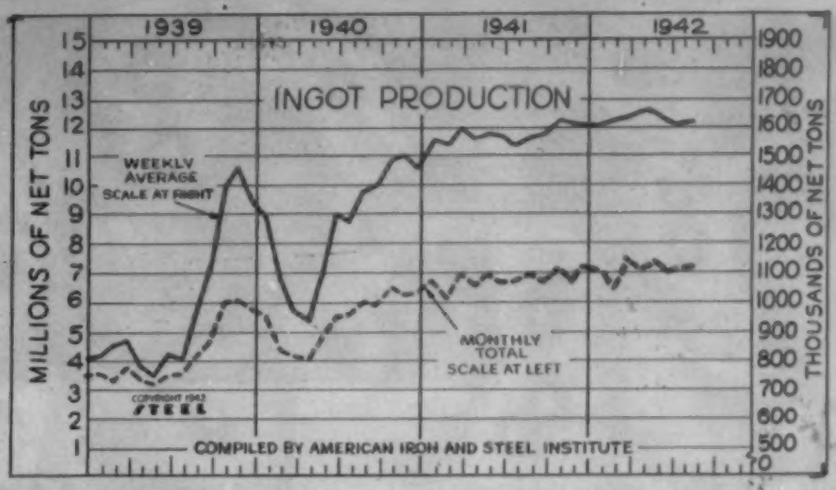
†Preliminary.



Steel Ingot Production

(Unit 100 Net Tons)

	Monthly Total		Weekly Average	
	1942	1941	1942	1941
Jan.	7,124.9	6,922.4	1,608.3	1,562.6
Feb.	6,521.1	6,230.4	1,630.3	1,557.6
Mar.	7,392.9	7,124.0	1,668.8	1,608.1
April	7,122.3	6,754.2	1,660.2	1,574.4
May	7,386.9	7,044.6	1,667.5	1,590.2
June	7,022.2	6,792.8	1,636.9	1,583.4
July	7,148.8	6,812.2	1,617.4	1,541.2
Aug.	7,233.5	6,997.5	1,632.8	1,579.6
Sept.	.....	6,511.8	.....	1,501.5
Oct.	.....	7,236.1	.....	1,633.4
Nov.	.....	6,960.9	.....	1,622.6
Dec.	.....	7,150.3	.....	1,617.7
Total	.....	82,636.9	.....	1,588.7



Construction Total Valuation In 37 States

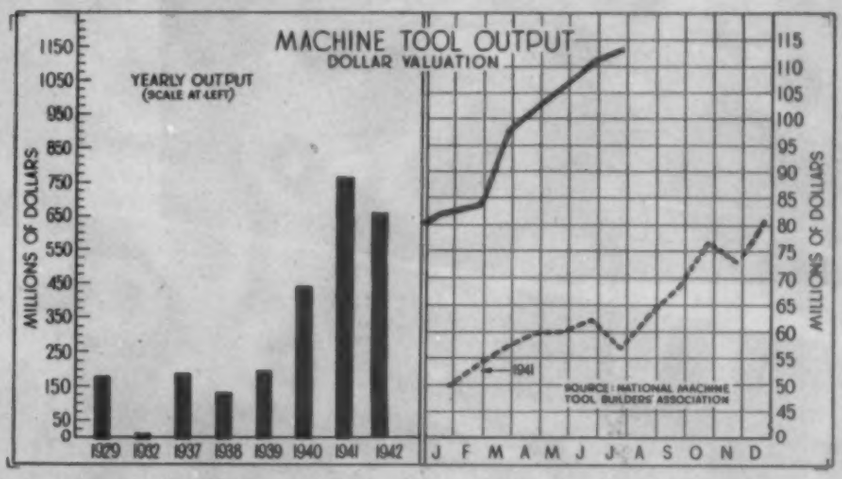
(Unit: $1,000,000)

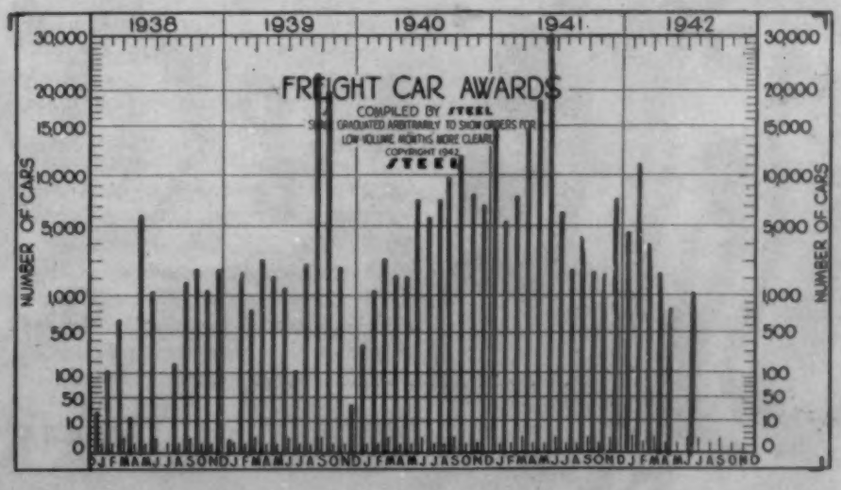
	1942	1941	1940	1939	1938
Jan.	$316.8	$305.2	$196.2	$251.7	$192.2
Feb.	433.6	270.4	200.6	220.2	118.9
Mar.	610.8	479.9	272.2	300.7	226.6
April	498.7	406.7	300.5	330.0	222.0
May	673.5	548.7	328.9	306.5	285.2
June	1190.3	539.1	324.7	288.3	251.0
July	948.8	577.4	398.7	299.9	289.8
Aug.	721.0	760.3	414.9	312.3	313.1
Sept.	.....	625.3	347.7	323.2	300.9
Oct.	.....	606.3	383.1	261.8	357.7
Nov.	.....	458.6	380.3	299.8	301.7
Dec.	.....	431.6	456.2	354.1	389.4
Ave.	.....	$500.6	$333.7	$295.9	$266.4

Machine Tool Output

(000 omitted)

	1942	1941
Jan.	$83,547	$50,700
Feb.	84,363	54,000
Mar.	98,358	57,400
April	103,364	60,300
May	107,297	60,800
June	111,147	63,000
July	113,600	57,900
Seven Months	671,629	404,100
Aug.	.....	64,300
Sept.	.....	68,400
Oct.	.....	77,200
Nov.	.....	74,600
Dec.	.....	81,485
Year		
1942 est.	.....	1,500,000
1941	.....	775,300
1940	.....	450,000
1939	.....	210,000


MACHINE TOOL OUTPUT
DOLLAR VALUATION
YEARLY OUTPUT (SCALE AT LEFT)
MILLIONS OF DOLLARS
1929 1932 1937 1938 1939 1940 1941 1942
1941
SOURCE: NATIONAL MACHINE TOOL BUILDERS' ASSOCIATION
J F M A M J J A S O N D


1938
1939
1940
1941
1942
FREIGHT CAR AWARDS
COMPILED BY STEEL
GRADUATED ARBITRARILY TO SHOW ORDERS FOR LOW VOLUME MONTHS MORE CLEARLY
COPYRIGHT 1942 STEEL
NUMBER OF CARS
J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D

Freight Car Awards

	1942	1941	1940	1939
Jan.	4,253	15,169	360	3
Feb.	11,725	5,508	1,147	2,259
March	4,080	8,074	3,104	800
April	2,125	14,645	2,077	3,095
May	822	18,630	2,010	2,051
June	0	32,749	7,475	1,324
July	1,025	6,459	5,846	110
Aug.	0	2,668	7,525	2,814
8 mos.	24,030	103,892	29,535	12,456
Sept.	.....	4,470	9,735	23,000
Oct.	.....	2,499	12,195	19,634
Nov.	.....	2,222	8,234	2,650
Dec.	.....	8,406	7,181	35
Total	.....	121,499	66,889	57,775

Apprentice Training

. . . developed by General Electric Co. produces qualified workmen

Fig. 1. (Left) — Instructor assisting girl beginner in her work

Fig. 2. (Left, below)— Training girl beginners in an unused garage, pending completion of their new building

LONG THE SOURCE of qualified young craftsmen, General Electric Co.'s standard apprentice training course at its various plants throughout the country, supplemented by several recently instituted shorter courses and emergency measures, today is proving effective in meeting the company's increasing need for workers skilled in war material production.

This 4-year apprentice course has produced more than 6000 graduates since its inception in 1901. Over two-thirds of these are still with General Electric. Upon completion of this 4-year course, the graduates are thoroughly grounded in all phases of mechanical production.

Trainees must be between the ages of 18 and 21, must have a high school education or equivalent, and a working knowledge of elementary and intermediate algebra, plane geometry and either physics or chemistry. Requirements in this respect vary somewhat with the works at which the course is given.

Once accepted, following an interview with the supervisor of apprentices and a representative of the personnel department, the trainee is required to submit proof of citizenship and undergo a strict physical examination.

In the training building, which is equipped with modern machinery throughout, the trainee follows the regular works schedule and consequently soon becomes familiar with factory life, routine and organization.

Trainee instructors are expert mechanics, chosen because of their knowledge, teaching ability and understanding of psychology.

The trainee's first month is spent in the beginners' group. During this period he learns sawing, simple lathe and shaper or drill-press work. Following this, ten weeks are spent entirely on

Program

By RAY E. ELLIS
Supervisor of Apprentices
General Electric Co.
Schenectady, N. Y.

Fig. 3—Boardwork in a strength-of-materials class, made up of young men who have had three years in the apprentice course

lathe work. This includes straight and taper turning, chuck and face plate work and thread cutting.

Next he joins the bench and assembly group, where for ten more weeks he learns jig and fixture making.

Then he spends 12 weeks with the milling machine group, learning both plane and universal milling, the cutting of spur and bevel gears, the milling of cutters and reamers and special milling.

During the final ten weeks he learns to do all the various kinds of grinding, including surface and Blanchard grinding, cutter, internal and cylindrical grinding.

Shortly after entering the training room, the trainee attends study classes which are conducted either in the plant or in co-operation with local school authorities. Reports of his work both in the training room and at the study classes are received at regular intervals by the supervisor of apprentices, who closely follows his progress.

Throughout his training period the trainee is paid an hourly wage, which rises automatically every six months. Piece work pay or other competitive wage scales are banned since the production of quality rather than quantity is the objective of the entire course.

Production Work: Further, all work done by the trainee during this period is useful work; that is, it consists entirely of mechanical or production work obtained from the manufacturing department. Such work, it is felt, stimulates the trainee's interest and impresses upon him the effect of waste and spoilage.

His training room program completed, the trainee moves out to the shops. During the remainder of his apprenticeship here he acquires a thorough schooling in production under the direct supervision of a foreman who regularly reports his progress to the supervisor of apprentices. Hence no trainee is allowed to become lost in the group of experienced workers around him.

In the meantime, committees composed of two or three general foremen, who themselves are apprentice course graduates, meet monthly with the supervisor to review the progress of each trainee, length of time he has spent on one job, etc. Not until the last six months of the course is a trainee kept on one job more than three months. By then his instructors know the type of work for which he is best fitted and hence try to place him in the manufacturing department doing that particular kind of work.

Three times a year reports of the trainee's progress are sent to his parents or guardian. If his marks are low, they are expected to urge him to apply himself more diligently. The conscientious trainee who seems to be failing is given all possible assistance. The trainee who lacks interest or who deliberately neglects to apply himself, however, is dropped from the course.

Upon graduation, the trainee receives a $100 bonus and a graduation certificate. Graduates are urged to widen their knowledge by attending the various night schools conducted by the company. Many do, and in time some enter college and ultimately become engineers.

Course enrollment figures have shown a steady upward trend year after year, but the increase has been tremendous in the past two years. There were 830 enrollments as of mid-1940, whereas there were 1600 as of mid-1942.

Shorter Courses: Under the pressure of a growing need for war production workers, General Electric some time ago instituted a number of shorter courses. Among these is the "streamlined" learners' course, the purpose of which is to teach an inexperienced worker one specific task thoroughly in a relatively short time.

Trainees of this short course, young men of 21 or slightly older, are taught to run lathes, grinders, milling machines, drill presses, to read blueprints and to

perform simple assembly jobs. During the course, the classroom work is done in co-operation with local vocational schools.

The trainees begin in one of three ways—on nonproductive work under the direction of experienced men; on productive work under the supervision of expert mechanics; or by observing and serving as helpers to the older men. Trainees are paid while taking this course.

Young men completing the course, consequently, are capable of doing many of the simpler forms of machine work formerly requiring expert craftsmen, thus freeing the latter for more important work.

"Pre-training": Too, not long ago General Electric put into effect a plan for "pre-training" groups of mechanics who regularly test new machine tools purchased by the company.

The plan had its inception when six mechanics made an "at-the-factory" study of the manufacture, assembly and testing of a number of large hobbing machines bought by the company.

Since the machines were urgently needed, it was felt that valuable time could be saved if men were sent to the supplier's plant to become familiar with all phases of fitting, assembling and testing the tools initially upon their arrival at one of the General Electric plants.

It is the practice of manufacturers of such tools first to assemble and test them at the factory, then dissemble them and ship them, and again assemble and test them at their destination before they are put into actual service. It was found that the new method resulted in a total saving of three months' time over the former method.

Under the "pre-training" plan, the six mechanics are now acting as instructors to other General Electric mechanics, who ultimately will become proficient in this time-saving method. Thus this idea has proved so satisfactory that this method is now being employed whenever large, complicated equipment is badly needed and time is an important factor.

Advance Training for Girls: An efficient emergency method still more recently put into effect was the advance training of girls for the production of war material, pending the completion of a new factory building.

The girls were trained in a garage, vacated by wartime restrictions on car sales, for the production of important equipment for Army bombers so that when the new building was completed, they were prepared to begin production immediately.

Other Training: Other measures accelerating General Electric's plant-wide personnel training are:

—The calling from two to six weeks earlier than usual this year of over 700 young graduate engineers to take the famous G-E "test" course. This course was established in 1894, when the company first sent recruiters to engineering colleges to hire outstanding seniors in advance of graduation. Among its 15,000 graduates are 19 General Electric vice presidents, a number of utility executives and several educators. The "test" course involves productive work and the testing of apparatus while the student learns additional engineering and company practices.

—Various courses designed to instruct Navy men in the care and operation of G-E submarine propulsion equipment, as well as other important G-E naval equipment; to train British, Canadian, and United States Army and Navy men in the maintenance of airplane equipment for high-altitude flying, and to educate Army and Navy men in the care of radio equipment, searchlights, gun controls, airplane locators, and similar devices.

These latter courses are given in the company's plants where the equipment studied is manufactured. They are largely a combination of theory and practice. The "students", who really are teachers being taught to go out and teach hundreds of others, are required to learn complete assembly and disassembly of the various devices studied, as well as to detect and correct faults intentionally placed in them.

Thus, from the apprentice boy studiously working at his lathe to the young graduate engineer enthusiastically reporting for "test", General Electric's various courses in its far-flung plants are daily —in many plants 24 hours daily, seven days weekly—contributing to the speed, efficiency and mounting volume of the company's war material production program.

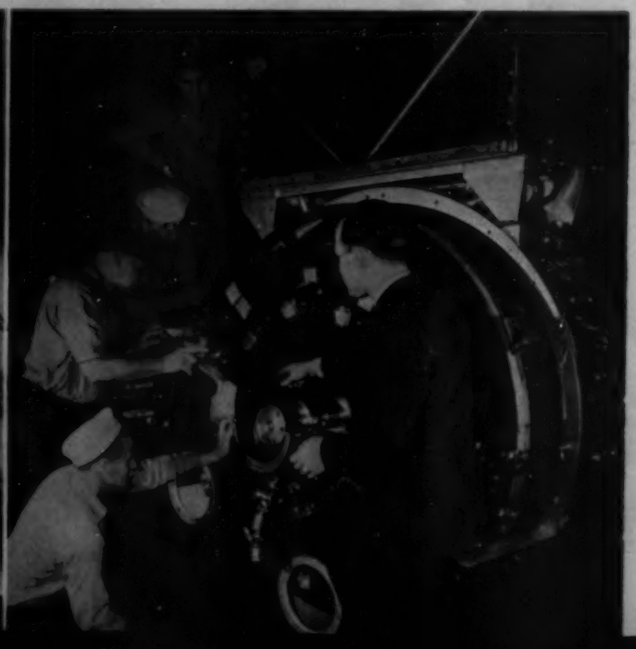
Upgrading: As for upgrading new workers, it has been found that the increase of war production on one hand and the steady drain of the draft on the other has put such a great premium on the competent, conscientious young worker that he is promoted upward to more exacting work as rapidly as his ability warrants.

Every new worker, as well as older ones, is under the close observation of his foreman from the outset. Once his supervisor determines that the worker's competence exceeds the requirements of his job, he is promptly promoted.

The occasional young worker whose progress is hampered by a temporary loss of self-confidence, or some environmental maladjustment, is given special attention.

Fig. 4. (Left)—Instructor in center is showing two apprentices how a cutting tool should be set on a shaper to work properly

Fig. 5. (Right)—Navy men learn details of a bearing housing assembly from instructor at right



Fighting the Production Battle with . . . IDEAS

A $1200 suggestion: Turning a mistake into an improved technique, Max Kholas, shop maintenance worker, devised a method of so cutting and gluing cotton-web belting that it can replace more expensive machine belts, saving time and materials. That idea brought Kholas a $1200 check from the company. Here he is studying various types of cotton-web belt adopted as a result of his idea

IN ANSWER to the call of War Production Chief Donald M. Nelson, America's industrial army is turning out a new type weapon by the thousands — not bombs or guns, but ideas to help win the battle of production.

In at least one major company of an American war industry, this "Battle of Wits" is not new. It has been going on for 32 years during which "idea-minded" workers have saved a million and a quarter dollars in valuable time and materials. These workers are the employes of the Westinghouse Electric & Mfg. Co., which inaugurated a suggestion system at its East Pittsburgh works in 1910.

Since that day, these employes have offered more than 102,000 written suggestions, and nearly one-third have been put into practice to increase production, improve methods of manufacture, save materials or provide greater safety. During 1941 alone, more than 5800 ideas were accepted, many of them contributing directly to improving and accelerating war production.

One workman found a way to cut his machine in half and increase its output materially; another applied a simple device to increase production of power generator parts 40 per cent; a third designed a machine to step up 20 times the manufacture of tiny lamps used in precision aiming of big guns.

Suggestors Rewarded: And as the ideas came in, checks went out to the suggestors—checks ranging from $2.50 to $1200. Indeed, many consistent suggestors among Westinghouse shop employes count the month a failure which has not produced extra money from suggestion awards, which are based on the savings their ideas make possible.

Ed Brannagan of Newark, N. J., is one fellow like that. Since this 29-year-old workman began assembling delicate electrical metering instruments at the Westinghouse Meter Works in August, 1938, 330 of his ideas have been accepted and put into practice. Ed has profited to the extent of $2580 in suggestion awards and ranks first in the number of suggestions accepted among the company's 83,000 employes throughout the nation.

How does he do it? By concentrating on one thing—the design of the instruments he assembles. All of his suggestions have recommended changes in these drawings and designs. Inasmuch as the meter works is producing war orders almost exclusively, every improvement Mr. Brannagan suggests for these electrical instruments is a boost for Uncle Sam, and an answer to Donald Nelson's request for helpful ideas.

Stephen Ligette is the number one idea-man at the Sharon, Pa., works where Westinghouse produces electric transformers and related equipment for the transmission and regulation of power needed for war production. His $1070 idea to replace insulating tape with less costly material topped all other suggestions in his division within the last year.

For sheer originality in increasing production, however, Mike Ferry took top honors with his idea to divide an existing machine in half and yet make it do 50 per cent more work.

Mr. Ferry operated one end of a long machine at Sharon which cut and trimmed the fin-shaped steel pipes that go together to form a transformer radiator. These radiators are needed to keep the transformers cool as the apparatus "steps up" or "steps down" electric power to the required voltages. Insulating oil in the transformer is run through the radiator and cooled during its winding journey.

Cuts Machine in Half: The machine Mr. Ferry and a co-worker operated consisted of a long table with a turret die or cutting tool at each end. Each of the operators placed a radiator section on the table so that the turret dies could shape or flange the openings on one end of each section simultaneously. Then they turned the sections around to flange the other two ends. Many of these pipe-like sections were 14 feet long and so unwieldy that the operator of one cutting tool had to wait until the other finished before he could perform his half of the job.

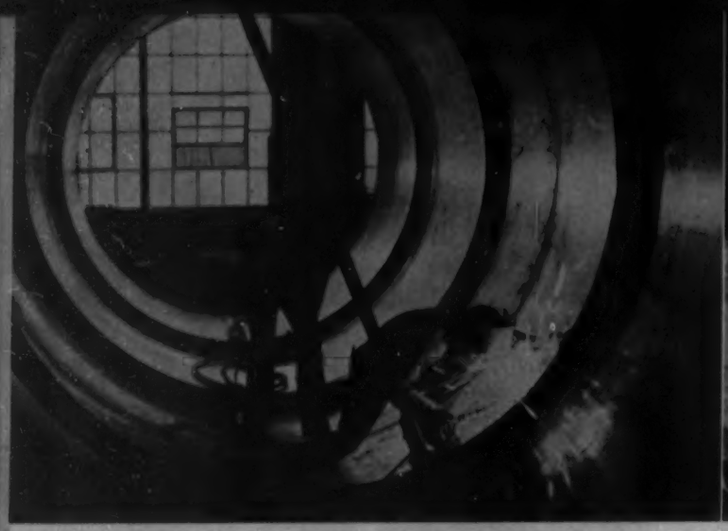
Mr. Ferry saw a way to break this bottleneck. Why not cut the machine in two, making each end a separate operation? Then each man could work steadily without interfering with the other. He submitted his idea and the cut was made. As a result, production of the radiator sections has been stepped up 50 per cent.

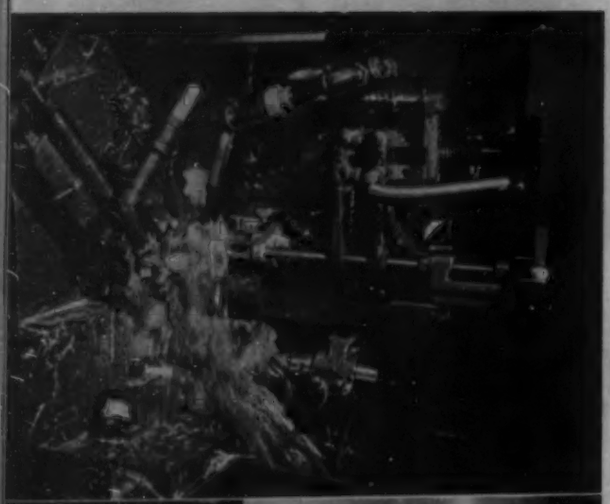
Another Sharon workman, Michael Dunn, found a way to increase the speed and prolong the life of a huge milling machine which cuts grooves in steel transformer pieces. The cutting tools of the machine are similar to the big saws found in lumber mills, but they are made of sheets of tungsten-carbide so thin that they vibrated or "chattered" while cutting.

To eliminate this vibration, Mr. Dunn suggested mounting pads of Micarta plastics so that the pads pressed against both sides of each rotary saw. As a result, a smoother cut was made possible, the life of the tool was increased 30 per cent and the machine could be run at a higher speed without risk of tool breakage.

Increased production of important gunsight lamps by more than 2000 per cent resulted from a suggestion turned

(*Please turn to Page 66*)





NEW TRAINING FILMS

. . . . show aluminum fabrication details

THREE NEW motion picture films have been produced by Aluminum Co. of America to assist in training workers in the fabrication of aluminum. The films are intended to aid instructors in the presentation of methods of welding, riveting and machining aluminum. All films are black and white, with sound, and are available in 16 and 35 mm. sizes.

"How To Weld Aluminum" passes on the know-how essential in torch welding, arc welding, brazing and resistance welding aluminum. Demonstration welds are made in close-up for each of the welding processes to illustrate proper technique. For example, in discussing torch welding, there is a pictorial presentation of flame adjustments, fluxes and how they should be mixed, welding wire, preparation of work, and then the actual welding operation in which the student can see metal melt in front of his eyes and watch proper methods of torch manipulation. A feature of this and the other films is the presentation of defects and wrong methods so the student can recognize them and avoid them.

The film, "How To Rivet Aluminum", graphically portrays methods used in making and testing rivets, preparing work for riveting, the actual process and final inspection. The picture discusses alloys commonly used in rivets, how rivets are driven hot and cold, and how to handle heat-treated rivets. Technique used in squeeze riveting, automatic and semi-automatic machine riveting, hand and pneumatic hammer riveting and blind riveting are described in detail.

"How To Machine Aluminum" presents an outline of the best practices to employ when machining aluminum with either hand or machine tools. The picture discusses alloys commonly employed, including the soft alloys as well as free cutting types, the proper top and side rake and the proper clearance for the tools, tool materials and finishes, cutting compounds, speeds and feeds.

CUTS HARDENED STEELS

—to permit drilling after parts have been hardened
—to eliminate distortion when heat treating is done after drilling
—to salvage parts when an error is discovered after hardening
—to speed production by allowing machining of fully hardened parts

By F. G. GEPFERT
Vice President
Black Drill Co.
Cleveland

THE STORY of how a tool designed originally for salvage operations developed into a production tool for use on hardened steels is today of vital interest to men in industry faced with the task of increasing war production.

The tool is a drill of unique design made of a new alloy material called "Hardsteel" and now available in sizes ⅛-inch and up.

The first uses of this drill were in die shops, rectifying mistakes not discovered until after the die had been hardened. For instance, the new drill was used on a die for making mess trays, drilling holes quickly and successfully for the insertion of stop pins, as shown in Fig. 1, in the full hardened metal—material harder than a shop file.

Another case of salvage occurred when a manufacturer of pneumatic tools found that he had a quantity of hardened steel liners in each of which the shop had forgotten to drill nine holes before hardening. With a Hardsteel drill, the holes were quickly made, saving a heavy investment in machine time and material.

The finished liners, illustrated in Fig. 2, were then successfully put into final assembly.

With such operations as these taking place in shops all over the country, it was not long until plant men began to sense the value of these drills as production tools wherever steels hardened to 40 rockwell C or higher were involved.

For example, these drills have eliminated some of the troubles caused by distortion in hardening for an aircraft engine manufacturer. Under the original shop procedure, camshafts of SAE 4620 steel were drilled and reamed before hardening. Owing to the unequal masses of metal in the cams and bearings, hardening after drilling and reaming caused sufficient distortion to necessitate an expensive, difficult and time-consuming straightening operation. At the same time, the bore was not as true as was desired.

To correct these troubles, a 43/64-inch Hardsteel drill is now chucked and mounted on the turret of a lathe as shown in Fig. 3. The camshaft, fully hardened to 60 rockwell C, is rotated at 700 revolutions per minute as the drill is fed to the work by hand. After penetrations to about ¼-inch, well through the case, the drill is backed off and the camshaft rifle drilled and reamed in the usual manner.

The new method has resulted in substantial improvements. Operations have been cut down. Production has been speeded. Rejects have been almost completely eliminated.

Another manufacturer making camshafts for straight-in-line V-type aircraft engines formerly left a plug on one end of the shaft to permit chucking for the grinding operation. After hardening, this plug was ground off—a costly and time-consuming operation. Since the introduction of the new type drill, the shafts are now cut to exact final length. The shafts are then drilled to within 1 inch of the far end before hardening, leaving the end solid for a center for the grinding operation. After hardening, a Hardsteel drill easily takes out the metal in the solid end to complete the drilling.

A large metal fabricator contracted to drill about twelve hundred 11/32-inch countersunk holes in disks of ⅛-inch hardened heat-treated high-alloy plate. Trials with ordinary high-speed drills proved absolutely futile. With the new

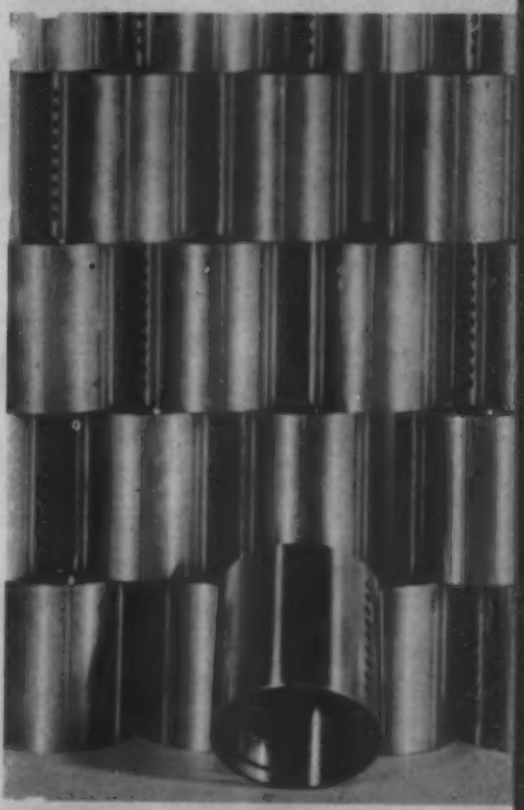


Fig. 1. (Top, right)—Drilling holes for stop pins in a hardened die that is being used to make Army mess trays. The Hardsteel drill cuts the material readily as shown by the chips

Fig. 2. (Center)—These hardened steel cylinder liners for air tools were saved from the scrap heap when someone forgot to drill the holes before the heat treating operation. They were salvaged by drilling the required holes in the fully hardened material using a Hardsteel drill

Fig. 3. (Bottom)—A Hardsteel drill cuts through the case of a camshaft that has been hardened to a value of 60 rockwell C. The drill is held stationary, and the work revolved

type drill in a Buffalo drill press running at 1500 to 2200 revolutions per minute with coolant, the operator was able to drill 7 pieces—a total of 56 holes—in 8 hours. The resulting holes were very clean and a delivery deadline was met.

Recently this same alloy material has been used successfully in reamers and tool bits, many of which already are used to speed up production jobs on hardened steels.

A large chain manufacturer needed 625 large links made of 3140 nickel-chromium steel—each link 16 inches long, 4 inches wide and 1⅛ inches thick with a 2¼-inch hole at each end through the 1⅛-inch dimension. Strict specifications called for a hardness of 400 to 500 brinell in the finished link.

The links were cut from an alloy bar, using an oxyacetylene torch. The two holes were then burned out, keeping them about ¼-inch smaller in diameter than the finished hole size.

When the job went into production originally, the holes were reamed to size and the piece hardened to the specified value. But this method was found impractical because hardening produced distortion up to as much as 1/32-inch, throwing the pin holes at the ends of the links out of alignment.

As a last resort a complete change of procedure was tried in which tool bits made of the new material helped to a satisfactory solution of the problem.

The links and holes were cut out as previously described, then the piece was heat treated and normalized to the required hardness. After this treatment it was found to be impossible to remove metal to bring the holes to size with any of the tools tried until two ⅝-inch Hardsteel tool bits were used in the boring operation.

These bits, by the way, are mounted 1⅝ inches apart in a boring bar on a heavy engine lathe. They are ground as fly cutters—cutting metal away from both sides of the hole simultaneously. The work is clamped into a master plate and revolves. The roughing cut is about 3/16-inch. The finish cut of 3/32-inch follows immediately after the completion of the roughing cut as the boring head travels into the hole. Chips come away uniformly, leaving a smooth and highly polished pin bearing surface in the hole.

Not only is this company able to turn out a better and more accurate link by boring after hardening, but production is fast because only 2½ minutes is required to bore each hole with tool bits of the new alloy.

Hardsteel is just what the name implies—a special alloy available in drills, reamers and tool bits. It was developed especially for cutting hardened steels, plastics and other hard materials such as amorphous carbon. It is speeding production and cutting rejects in hundreds of America's industrial plants and changing shop practice in many of them because it permits full hardening of steel pieces before drilling, reaming and machining, thus eliminating the misalignment caused by any distortion that may result from heat treatment of the finished piece.

Substitution of Glass Fiber Tape Successful

Successful substitution of glass fiber tape in place of mica as coil insulation in the primary coil of induction-type brass furnaces is reported by the Western Cartridge Co., East Alton, Ill.

Use of the insulation made it practicable to increase furnace temperatures to the point where it was possible to produce five pours of 1500 pounds each during each 8-hour shift.

Furnaces in the Western Cartridge plant have a sleeve-shaped form composed of ceramic material which retains the helical flat copper coil. The glass fiber tape was spiraled between turns in the coil to form a double helix composed of alternate layers of copper and glass fiber tape. Insulation between turns in the coil is required to prevent short circuiting.

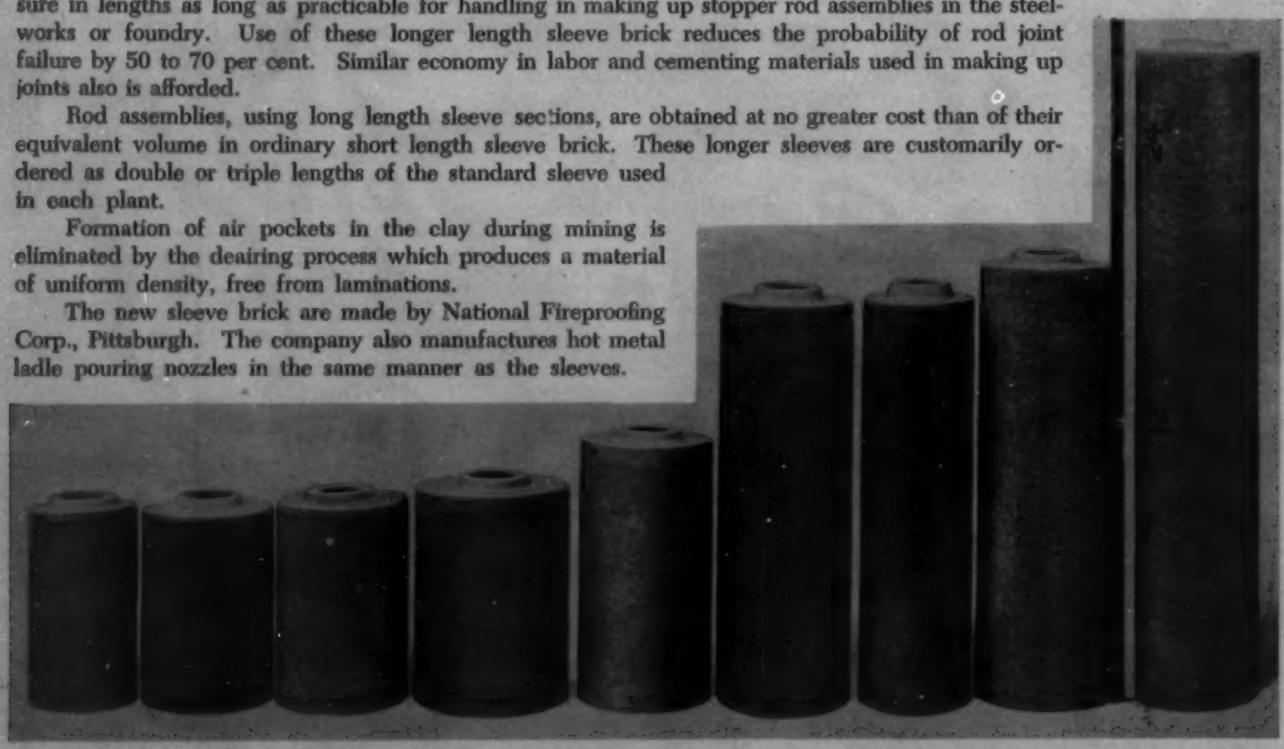
MAKES SLEEVE BRICK IN LONGER LENGTHS

A NEW type of sleeve for hot metal ladles is extruded through a die at extremely high pressure in lengths as long as practicable for handling in making up stopper rod assemblies in the steelworks or foundry. Use of these longer length sleeve brick reduces the probability of rod joint failure by 50 to 70 per cent. Similar economy in labor and cementing materials used in making up joints also is afforded.

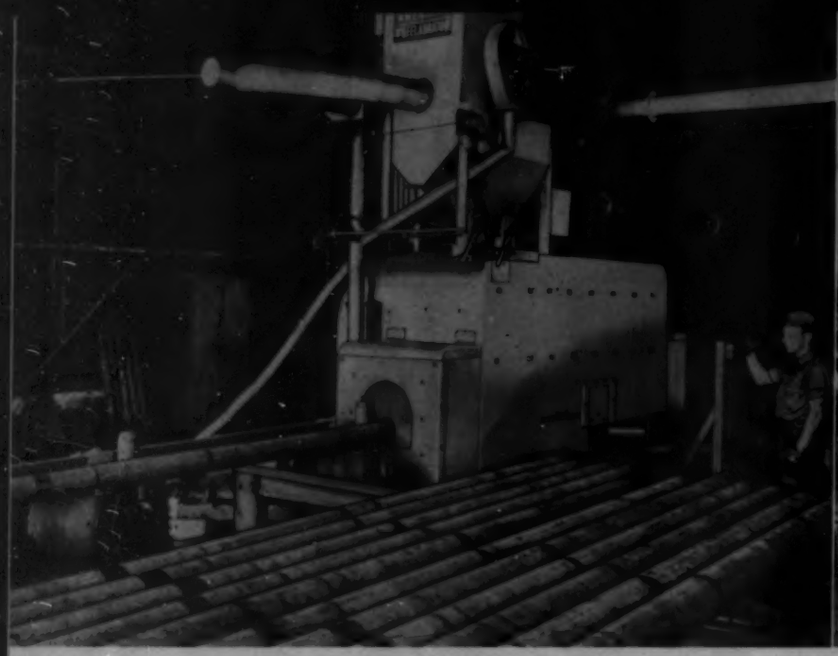
Rod assemblies, using long length sleeve sections, are obtained at no greater cost than of their equivalent volume in ordinary short length sleeve brick. These longer sleeves are customarily ordered as double or triple lengths of the standard sleeve used in each plant.

Formation of air pockets in the clay during mining is eliminated by the deairing process which produces a material of uniform density, free from laminations.

The new sleeve brick are made by National Fireproofing Corp., Pittsburgh. The company also manufactures hot metal ladle pouring nozzles in the same manner as the sleeves.



IT'S "JUNK" TO YOU••• — There's a harvest of scrap in your plant—obsolete dies, jigs, patterns and moulds; idle water tanks and their supports; scraps of rods, bars and other steel shapes . . . It's "junk" to you. But, it means Victory to America. Every pound of scrap brought back into the market boosts production of tanks, guns, planes and ships. You can launch your own salvage campaign without waiting for a community drive. Delegate one man to find every article of doubtful use around your plant and give him the authority to do a real salvage job. Get in the scrap . . . and do it now. ALAN WOOD STEEL COMPANY, Conshohocken, Pa.



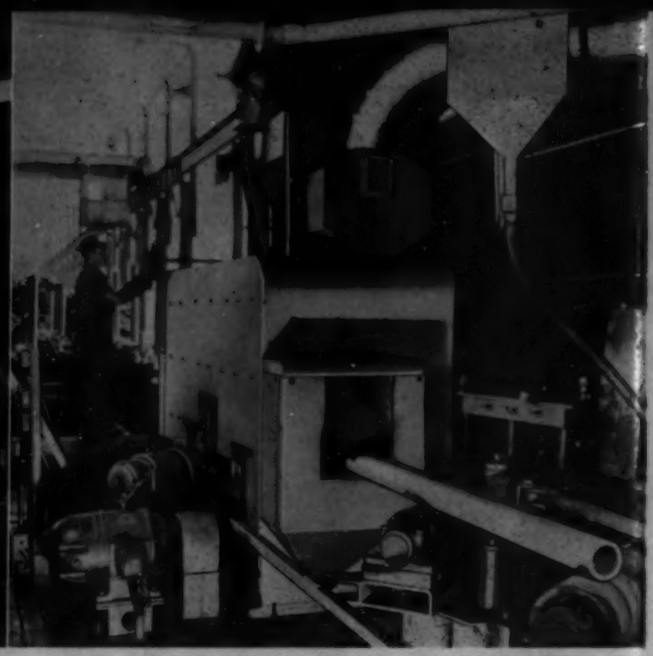


Fig. 1 (Left, above)—Lengths of uncleaned pipe are seen here in the loading position on the entry side of the machine which cleans the pipe exterior. Note the wide roll set at an angle at left. This revolves the pipe and simultaneously causes it to pass through the cleaning machine due to the angle of drive
Fig. 2 (Right)—Here pipe is emerging from the machine in Fig. 1 which cleans the pipe exterior by means of two abrasive units blasting upward at the pipe as it passes through

Removing Heat-Treat Scale

IN ALMOST every manufacturing step in the production of seamless steel tubing heavy heat-treat scale is formed. This has always been a vexing problem because of high cleaning costs and the difficulty of removing the scale uniformly. Recently National Supply Co., Spang-Chalfant Division, Ambridge, Pa., decided to do something about it.

For many years the tubing made by this company was cleaned by an outside jobbing concern. Inasmuch as this arrangement did not afford the proper control and close supervision desired, the company determined to incorporate the cleaning operation with their other manufacturing processes.

The problem consisted of cleaning both the interior and the exterior of all "Spang" low-carbon and high-alloy seamless steel tubing, which varies from 2 to 14 inches outside diameter and from 18 to 50 feet in length. A cleaning system built by American Foundry Equipment Co., Mishawaka, Ind., was specially designed to handle this application.

The equipment here includes an airless Wheelabrator for cleaning the exterior of the pipe and an air blast for descaling the interior.

It is difficult to give standard production figures as to cleaning speed because this depends entirely upon the size of tubing, the type of steel from which the tubing is made, and the condition of the scale due to previous heat treatments. However, 4½-inch standard low-carbon tubing is being cleaned at the rate of 18 feet per minute for the exterior and 14 feet per minute for the interior.

External Cleaning: A special cabinet housing two standard Wheelabrator blast units is used for cleaning the outside of the pipe. See Fig. 1. These two units are mounted in the bottom of the cabinet so as to blast upward and in direct line with the rotating tube as it passes through the cabinet on the conveyor mechanism. Since the distance between the blast units and the surface to be blasted is constant for all sizes of tube, uniform cleaning is assured.

Pipe Travel Continuous

Travel of the tubing on the conveyor rolls through the cabinet is continuous—loading being handled at one end of the cabinet and unloading at the other. As the complete length of tube enters the cabinet, another tube is rolled into position for entry into the blasting area. After external cleaning, the pipe is automatically rolled off the conveyor upon skids and is ready for the internal cleaning step.

Due to the different types and sizes of tubing and the diverse scale encrustations encountered, each of which may require a slightly changed cleaning speed, the conveyor rolls can be varied as to the number of revolutions per minute and as to the skew angle. This makes it possible to control the length of time the pipe is held in the blasting area.

In Fig. 1, a number of lengths of uncleaned tubing are in the loading position at the entry side of the machine. The tube on the conveyor rolls has just entered the cabinet for external cleaning.

In Fig. 2 the cleaned tube is shown being discharged. The operator is controlling the flow of metallic abrasive to the two blast units.

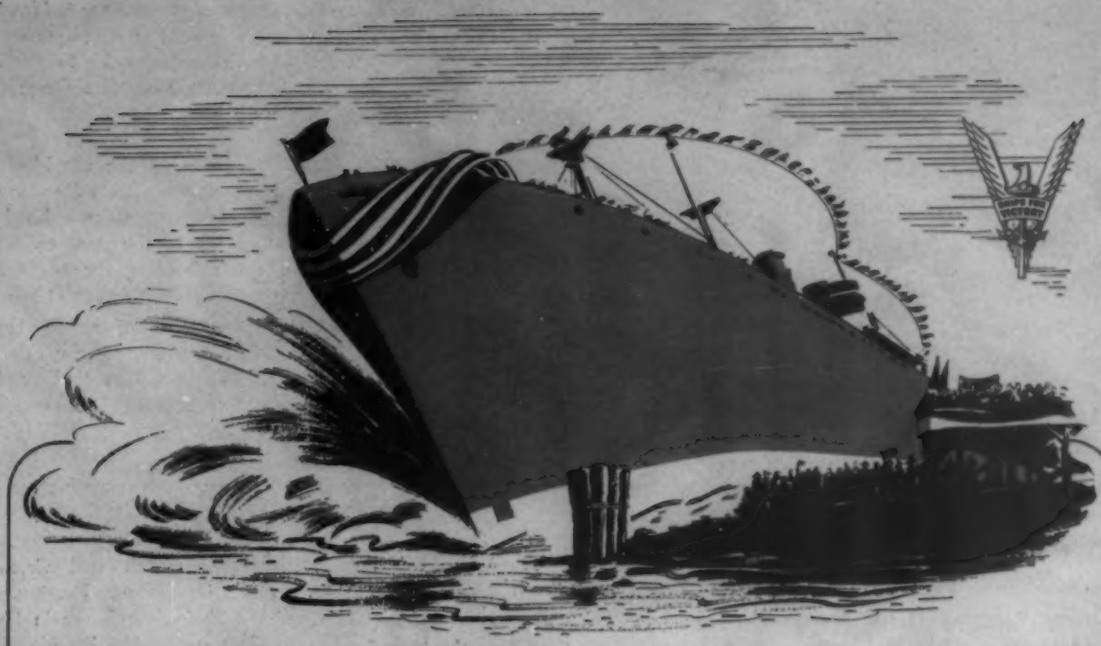
Internal Cleaning: The air blast machine, specially designed for cleaning the interior of the tube, is located adjacent to the Wheelabrator cabinet. As the externally cleaned tube leaves the cabinet, it is rolled on skids to the air blast machine where cleaning of the interior is accomplished with a lance-type blast nozzle long enough to blast the entire interior surface of the long pipe. See Fig. 3.

This nozzle is inserted into the end of the rotating pipe, which is supported on revolving steel disks. Both the speed at which the tube rotates and the feed of the nozzle can be regulated to obtain the most effective cleaning.

The storage hoppers and the air blast tank, which controls the mixing of air and steel grit abrasive to the desired proportions, are mounted on a steel car riding on a track. As the nozzle travels into the pipe, cleaning as it progresses, the whole blast mechanism rides forward, being drawn by a steel cable.

A belt conveyor, mounted under the pipe cleaning device, returns the spent abrasive from the far end of the pipe to the boot section of the elevator for recirculating in the blasting equipment.

Fig. 3 shows the operator blowing dirt out of the interior of a 5½-inch tube



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Bring 'em on! The faster they come the better we like it. Plates, shapes, fabricated assemblies, chain, rods, bolts, nuts—everything from the biggest articles to the smallest—we can handle them all without delay. We now have not only the world's *largest* job hot-dip galvanizing plant but also the world's *fastest.* Our extra facilities (we have capacity to spare) and our streamlined production methods enable us to receive, galvanize, and ship material faster than ever before. It's "in and out" the same day, if necessary. That's how we're doing our part to help speed Uncle Sam's armament program. Send your Navy and Maritime Commission materials to us for hot-dip galvanizing or pickling and painting. We are centrally located, convenient to steel mills, fabricating plants and shipyards.

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Fig. 3—Here an operator is blowing dirt out of the interior of a pipe, using a compressed air nozzle, prior to starting the blasting nozzle through

prior to inserting the air blast nozzle. The far end of the pipe fits into a metal housing which serves as a hood for removal of air to the dust collector and as a catch housing for spent abrasive to be returned by the belt conveyor.

After the interior of the tube is cleaned, the nozzle is retracted, the tube kicked off the disks to nearby skids, and a new length of tube rolled into cleaning position.

Fighting with Ideas

(*Continued from Page 59*)

in by Matthew Westphal at the company's Lamp Division works in Bloomfield, N. J. The tiny lamp, about half the size of a walnut and used in delicate mechanisms for aiming big guns, was made entirely by hand until Mr. Westphal recently redesigned the lamp so it could be turned out on high speed machines.

Now valuable floor space formerly used by girls sitting at work benches is available for other use, and the girls have been placed on other important jobs. In addition, the machine-made lamp requires only half as much glass tubing as had the old model.

At the Westinghouse South Philadelphia Works, C. R. Sturm suggested a way to eliminate the "prime coat" or base coat of paint on certain electrical marine equipment, thus freeing workmen who now can spend about 4500 additional hours a year on more productive activity. The idea also saved 1000 gallons of paint and netted Sturm $500.

What is most interesting to the engineers who study each suggestion submitted is the relative simplicity of the really good ideas. Simplicity is the key not only to a valuable idea but to the success of the entire Westinghouse suggestion system.

Red Tape Avoided: "Our workers do not have to cut through a lot of red tape to get a hearing for their ideas," explains W. G. Marshall, Westinghouse vice president. "When they see a way to do their job better, they merely jot down the idea on a slip of paper and drop it in the shop mail. From that point on, the suggestion machinery is automatic.

"Once these slips of paper are delivered to suggestion headquarters, they are serially numbered, classified as to type of product, operation and the employe's name, then filed in numerical order. Each suggestion then is acknowledged so that the employe knows his idea is receiving consideration.

"Before the suggestion committee makes any attempt to pass on the ideas," Mr. Marshall continued, "copies are forwarded to that member of the committee representing the plant department most familiar with the subject. All suggestions recommended by the various department representatives for acceptance are further considered by the committee as a whole."

At the Westinghouse East Pittsburgh works where the suggestion system was introduced in 1910, the committee consists of seven men including a permanent chairman and secretary and five temporary members. They meet once a month, or oftener if necessary, and determine the amount of each award to be made. When it is possible to make reliable estimates, awards are based upon ten per cent of the first year's savings the suggestion will produce.

Employes Get 18 Per Cent of Saving: But some ideas do not lend themselves to a ready estimation of future savings, and in those cases the originality of the idea plays a big part in the final decision. Since 1910, Westinghouse workers have been paid $231,671.20 in suggestion awards—18.5 per cent of the estimated annual savings these suggestions made possible.

At the East Pittsburgh works, two veteran workmen today are engaged in a friendly race that typifies the spirit behind this idea offensive. Since his first contribution in 1913, John F. Carlson has earned awards for 164 practical ideas, but at last count he trailed Michael J. Defino, whose total is 177.

This pair, setting the pace for more than 20 years, agree there is no secret formula involved in idea production.

"I just keep my eyes open and watch for improvements wherever I may be working," says Mr. Carlson. "I've worked as a switchboard wireman and assembler, inspector and estimator since coming with Westinghouse in 1903, and most of my suggestions have involved improvement in plant apparatus or the elimination of hazards."

For example, he suggested a rearrangement of the telephones in a factory office which simplified the handling of calls. Large lamps in one of the freight elevators were being broken continually. The versatile Carlson suggested a way to protect the lamps and there was no more breakage.

Saves War Materials: Mike Defino, current leader at East Pittsburgh, works in the company's electric meter division. Recently he saved scarce war materials by suggesting a way to repair nichrome steel hooks used to hold copper plates in oxidizing furnaces. Previously, the hooks became partly disintegrated by the 2000-degree Fahr. temperature and could not be repaired.

By developing a color coding system for connecting the wires in welding control equipment, he saved valuable working time. With the ends of the wires painted different colors, workmen now swiftly match each wire with its proper connection.

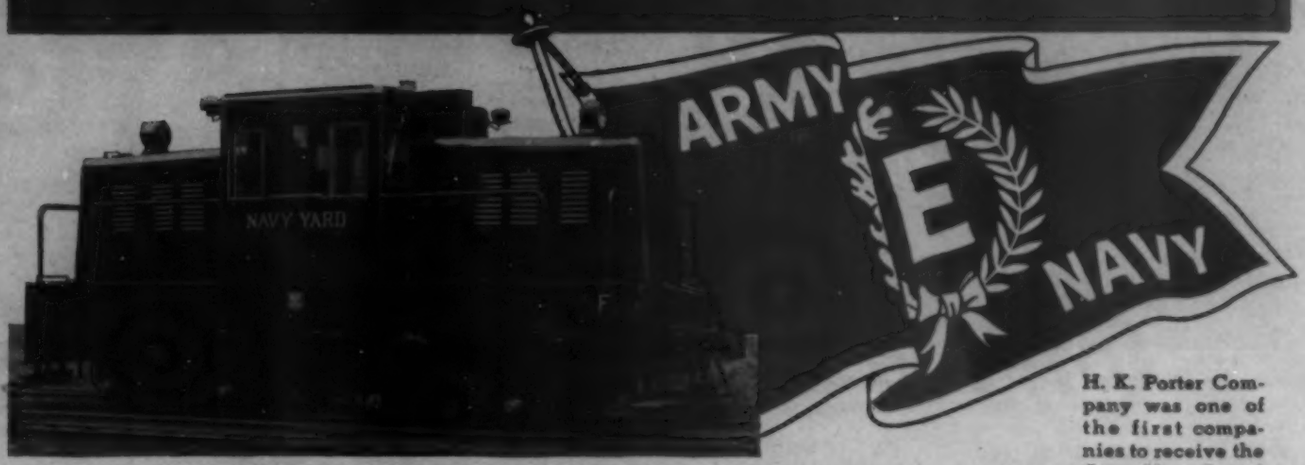
Although the actual cash saving of many suggestions is relatively small, others are worth thousands of dollars in time and materials.

The top award won by a Westinghouse employe was the $1200 check that went to Max Kholas for turning a mistake into an improved production method. A former soldier in the Russian Czarist army, Max came to America in 1905 and has worked as a machine belt mender at Westinghouse for 22 years.

One day in 1939, while doing a routine job of mending and fitting belts to keep machine wheels turning, Max found he had miscalculated on the order

(*Please turn to Page 89*)

Serving the ARMY and NAVY as well as INDUSTRIAL PLANTS

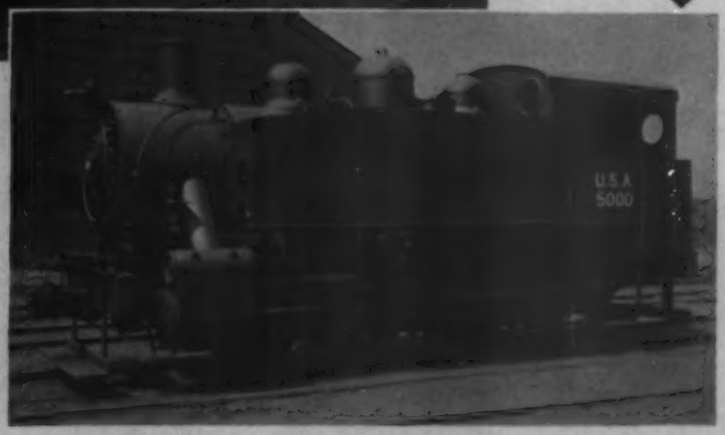


H. K. Porter Company was one of the first companies to receive the Army-Navy Award for high achievement in production.

A typical 50-ton Diesel Electric for Navy Yards.

One of the many Diesel Electric Locomotives supplied to the U. S. Army. Illustration shows one of 65 tons.

A 50-ton Porter Steam Locomotive designed for the U. S. Army.



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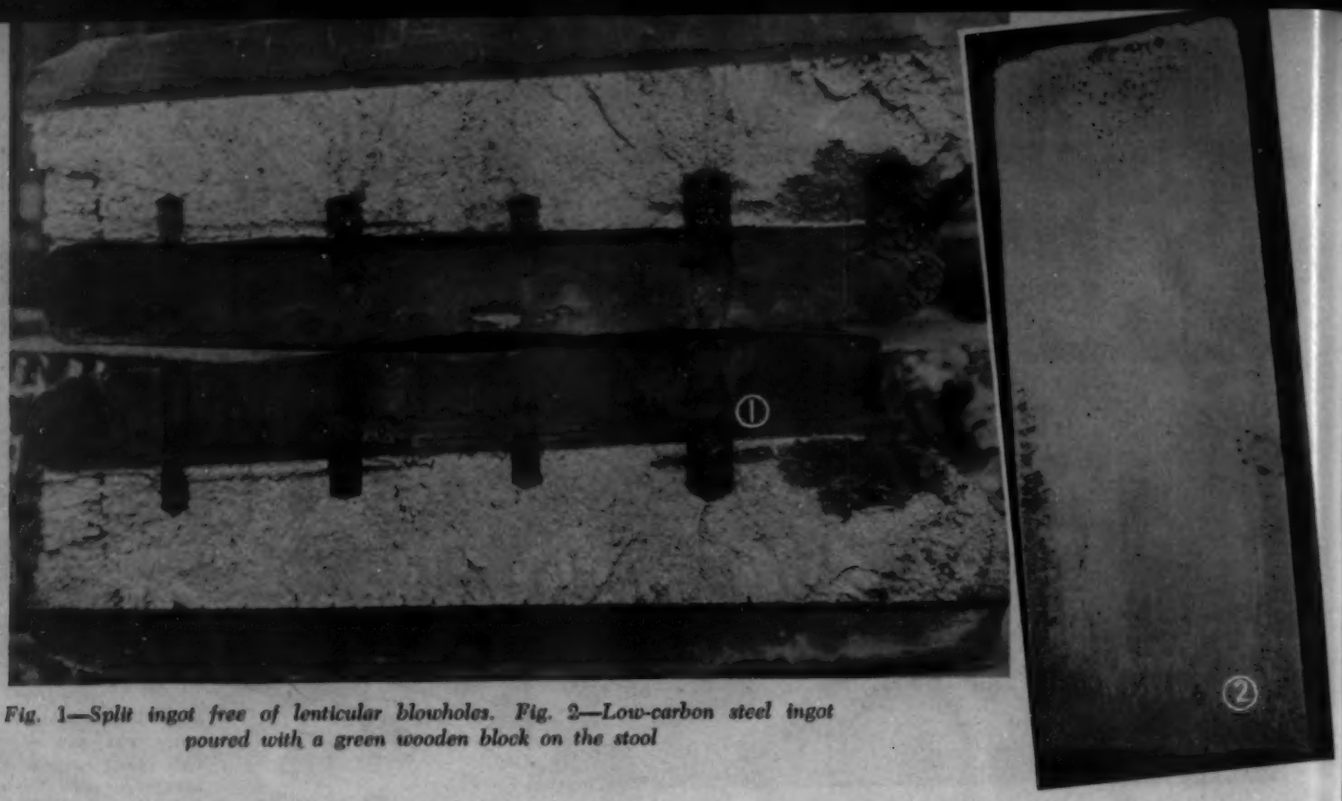

Fig. 1—Split ingot free of lenticular blowholes. Fig. 2—Low-carbon steel ingot poured with a green wooden block on the stool

The Manufacture of

HIGH-QUALITY LOW-COST STEEL

Heterogeneity of Ingots

By PAUL J. McKIMM
Cleveland

SEGREGATION of some of the principal constituents in cast-steel ingots is evident in all rimmed or effervescent steel and varies over wide ranges.

Extreme chemical variance is attributed to refining in the furnace bath, that is, a well-refined heat will have a minimum amount of segregation and as furnace conditions drift to that of poor practice segregation becomes more pronounced. For instance, if an ingot has a ladle analysis of 0.08 per cent carbon (killed test) the actual steel analysis will be approximately 0.06 per cent carbon because between an open test and one that is killed with a few pellets of aluminum there is a carbon differential of 2 to 2¼ points. Therefore, the carbon variation in a split ingot will be 0.06 to 0.07 per cent. Usually 0.03 per cent carbon is found in a well-made steel while in one of poorer practice it may be 0.01 per cent. The maximum top core carbon rarely will be higher than the recorded ladle carbon until the latter conforms to ranges usually above 0.12 per cent at which point the top ingot core carbon will be slightly higher. In still higher carbon specification the whole range moves up. With a 0.25 per cent carbon the top ingot core carbon will be 0.28 to 0.29 per cent.

The natural phenomenon of segregation which occurs when molten steel cools slowly and changes to the solid state is troublesome. When molten metal is poured into a cast-iron mold the so-called "skin" which preceeds the rising metal is of the same analysis as the average ladle content. This "skin" is from ⅛ to 3/16-inch thick and forms the ingot wall aided by the rimming action. The wall extends from the surface to the columnar row of spherical blowholes and always ranges from 1 to 4 inches thick in well-made steel. During solidification, gases are evolved causing the rimming action, the most pure steel solidifying first, forcing the more impure mother liquor toward the center top core. As the metal becomes more and more impure the time of solidification becomes greater which widens the gap between the liquidus and solidus. The most impure area of an ingot usually will be in the uppermost core but frequently areas adjacent to blowholes will show evidence of impure metal and excessive segregates. Two general methods are employed for checking steel for segregation: One is to split an ingot off center so that the surface can be machined smooth for macro, sulphur or visual examination and drilling taken for analysis at regular intervals from the top to bottom and from the edge to center. The second is that of a crop test which is sufficient for process purposes. After testing a great number of split ingots it will be found that the highest point of carbon will be in the top core while the wall will be uniform throughout as well as the bottom third portion or higher. If there is any lower variation it will be in the top wall. For example, an ingot from a ladle carbon of 0.08 per cent will contain throughout 0.04 per cent carbon and

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This concludes the series of articles on "The Manufacture of High-Quality Low-cost Steel." Other articles in the series and the date of their publication in STEEL are:

Basic Open-Hearth Iron, June 23, 1941 p. 62.
Basic Open-Hearth Scrap, July 7, 1942 p. 68.
Basic Steelmaking Practice, Aug. 11, 1941, p. 87.
The Melting Phase, Sept. 29, 1941, p. 78; Dec. 15, 1941, p. 62.
Deoxidation, March 9, 1942, p. 76.
Heating of Steel, June 17, p. 54; June 24, p. 50; July 1, 1940, p. 52.
Improving the Quality of Hot-Rolled Strip, April 28, p. 74, May 5, 1941, p. 66.
Residual Tin in Sheet Steel, May 6, p. 64; May 13, p. 60; June 17, 1940, p. 62.
Age Hardening of Cold Reduced Strip, Sept. 30, p. 44; Oct. 7, p. 46; Oct. 14, 1940, p. 139.

if any one point be lower it would be 0.03 per cent carbon in the top wall. Therefore, it is most practical to crop the top of the ingot free from all visual imperfections, such as pipe or sponginess, and then shear a cross section for chemical analysis. Drillings should be taken in the true center known as "TM" (top middle) and in the edge known as "TE" (top edge) and these will indicate maximum and minimum variation. The last two ingots are not always representative of the heat due to contamination with slag and in cases of a ladle reaction the analysis will be greatly out of line.

The best method for ladle samples is to obtain three from each heat. Samples not thoroughly killed with aluminum, as indicated by blowholes and a cauliflower sinkhead, are not used on account of possible low-carbon results. Double poured and dirty samples likewise are not used. Crop samples from slabs are selected and by extensive research it was found that the difference between the top center and top edge will show the maximum segregation in the prime steel.

Fig. 5 is a sketch of a slab for sampling. Point A represents the center or top core while either point B can be drilled for the edge sample. Fig. 6 shows a method for sampling sheet bar, plates and other thin sections. The sample is drilled from surface to surface at the center line which yields the two wall and the core areas at the point of maximum average. With sheet and cold strip the customary practice is to fold a number of laps over on themselves where drillings will represent several core areas and twice as many surface areas. Sheet analysis are representative because croppage eliminates most of the high-segregate portions so that the variance at this point is only about 0.03 to 0.05 per cent in carbon and can be ignored.

In order to determine metalloid segregation for different sections of a heat, three laboratory samples were taken from each heat, one at the eighth, one at the sixteenth and another at the twenty-fourth ingot, the total number of ingots being 28.

The following analyses are representative and show that steel is uniform in the ladle.

Ladle Test	Position of Ingot 8th	16th	24th
Carbon, %	0.13	0.13	0.13
Manganese, %	0.41	0.42	0.42
Phosphorus, % ..	0.009	0.009	0.011
Sulphur, %	0.025	0.025	0.024

Similar results were obtained when taking a sample of the last ingot not showing slag. A slight increase usually is found in phosphorus of 0.001 to 0.002 per cent toward the end of pour. This is attributed to the action of the basic slag on the more acid and the consequent reduction of phosphorus from the slag by the carbon in the steel. Neither do the metalloids segregate to any appreciable extent when the solid steel is reheated.

Often considerable variation in analyses from one section of a heat to another occurs because of a reaction on a ladle skull and it is essential to prevent skulls or cold heats generally if quality steel is to be attained.

Gases Cause Blowholes

Although primary segregation is not dependent on gas evolution nevertheless it has some relationship. In rimming steels the gases evolved immediately after pouring consists of about equal proportions of carbon-monoxide and nitrogen. At the beginning of solidification and when the rimming action is the most vigorous the proportion of carbon-monoxide gas increases until it comprises about 80 per cent of the total gas evolved. The proportion of hydrogen given off is small at first but it increases slowly as the rimming action subsides; finally, toward the end the proportion of hydrogen equals that of carbon monoxide. The proportion of nitrogen decreases fairly rapidly to a low point. Hydrogen and nitrogen migrate from the greatest cross-sectional area toward the ingot wall and promote the commonly encountered honey-comb lineal blowholes in thin-walled ingots.

Furthermore, hydrogen in the uppermost area of the ingot tends to escape but during solidification it often is entrapped, and forms globular or stringer blowholes or possibly interstitial spaces between the dendrites. After solidification most of the hydrogen is present in supersaturated solution, so that it builds up absolute pressure within the steel which may result in high internal stresses, as is familiar in pickling. It is not definite what the chemical or thermodynamic concept of solution pressure of a gas in a solid really means in terms of strength of the solid.

A favorable feature is that hydrogen has a high diffusivity in steel so that its harmful effects may be overcome by heat treatment. The harmful effect is that unusual amounts of hydrogen may influence the control of rimming action, since aluminum or other deoxidizers have no effect upon it. While hydrogen during the later stages of solidification evolves more than other gases and hence most likely forms blowholes, or accumulates in the interstices between dendrites, it does not form a stable solid compound with steel; its presence in solution, therefore, tends to set up internal stresses which increase in magnitude as the temperature drops.

Representative gases leaving a rimmed ingot and in the order of their emission, follow:

Gas	Per Cent
Carbon monoxide	5
Hydrogen	27
Oxygen	6
Nitrogen	67

Nitrogen present in steel as occluded gaseous nitrogen and as iron nitrides promotes brittleness and affects the thermal transformation points.

With new improvements in analytical methods for determining the total gas particularly hydrogen in finished steel, the lower the hydrogen appears to be. Practically no hydrogen exists or at least never more than 0.0004 per cent. However, hydrogen diffuses through iron rapidly; in fact, it can be driven off from solid iron at low temperatures or a low red heat. Therefore, the solubility relations of hydrogen and steel never would suffer such a sudden change as to cause

Fig. 3—Low carbon rimmed steel made with an iron charge of 69 per cent

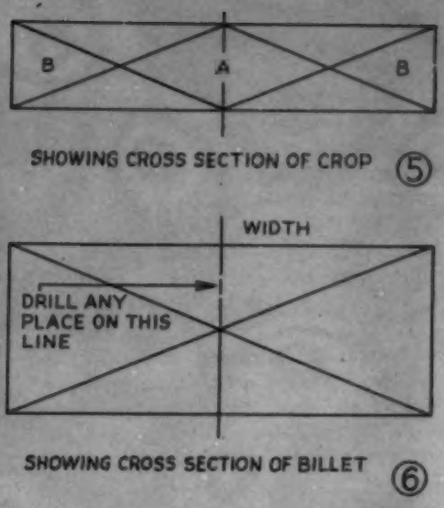


Fig. 4—Low-carbon rimmed steel ingot free from defects. Fig. 5—Cross section of a slab crop showing locations for test drillings. Fig. 6—Sheet, plate or strip showing the ideal location for securing sample

the actual liberation of hydrogen to form blowholes.

The difference in heterogeneousness especially the type of blowholes which is evident in split ingots is that the surface of the lenticular blowholes always are bright and silvery similar to steel subjected to bright annealing which indicates that the cavity either must have contained a reducing gas or at least a neutral one, and it is reasonable to assume that it was either hydrogen or nitrogen or a mixture of both. These lenticular blowholes are sort of a pencil formation and generally confined to an area about 30 per cent up from the bottom whether the ingot is big-end down or up. The globular blowholes aligned on the inner side of the ingot wall and those usually of larger size at the upper ingot section always are coated with oxide indicating that an oxidizing action has taken place.

Blowholes Usually Corrugated

The lenticular or pencil blowholes usually are corrugated as though they were a long ellipse which had been corrugated. This condition never has been explained but must be connected with their mode of formation during solidification.

Fig. 1 shows a split ingot free of lenticular blowholes. The row of cavities is 6 inches from the surface. These blowholes are minute, the top core area being solid. This heat had the full calculated yield into slabs. This is an exceptionally high-quality rimmed ingot.

Fig. 3 is representative of a low-carbon rimmed steel produced from a 160-ton heat having a charge of 60 per cent iron; the ore charged was replaced with blast furnace sinter and soaking pit cinder. This is also an excellent rimmed ingot having a wall of over 5 inches. It is free of honey-combs and is solid to the extreme top.

Fig. 4 illustrates a 0.08 per cent carbon rimmed steel and is offered to show an ingot absolutely free from any blowholes or cavities or discontinuities whatsoever. The chemical segregation was in line with that of any other normal ingot.

At the time the movement toward the large hot strip mills began, tests were made to determine the effects of segregation that might be encountered in molds of different thickness. Molds each 16 x 48, 20 x 48, 24 x 48 and 32 x 48 were compared with a set of 17 x 17-inch molds. These different sets were placed on one drop so that steel from one heat and ladle could be used for the test.

Samples were obtained from the top and bottom of the first and last ingot of each group and drillings taken at the edge of the shear end of the slab, mean (between edge and center) and middle (center).

A wide variation existed in the phosphorus and sulphur analysis at the top of the ingots which was attributed to a difference in the height of the sample. Extensive research suggested the use of a 24-inch thick ingot. When heavier ingots were desired molds 26, 28 or more inches thick were employed. The best over-all results concerning segregation, slab yield and uniform ultimate quality were secured with 32 x 48-inch ingots.

	Per Cent Carbon		
Ladle analyses	Edge of top crop	Middle of top crop	Edge of bottom crop
0.07	0 03	0.04	0.04
0.08	0.03	0.06	0.03
0.09	0.04	0.09	0.04
0.10	0 04	0 09	0.06
0.11	0.04	0.07	0.07
0.12	0.05	0.12	0.07
0.13	0.08	0.14	0.08
0.14	0.11	0.14	0 08
0.15	0.11	0.17	0.09
0.16	0.08	0.16	0.10
0.17	0.09	0.18	0.09
0.18	0.11	0.21	0.13
0.19	0.09	0.17	0.10
0.20	0.11	0.20	0.12
0.21	0.12	0.22	0.14
0.22	0.10	0 22	0.11
0.23	0.15	0.25	0.17
0.24	0.23	0.27	0.28
0.25	0.16	0.28	0.16
0.26	0.15	0.29	0.16
0.36	0.40	0.40	0.37

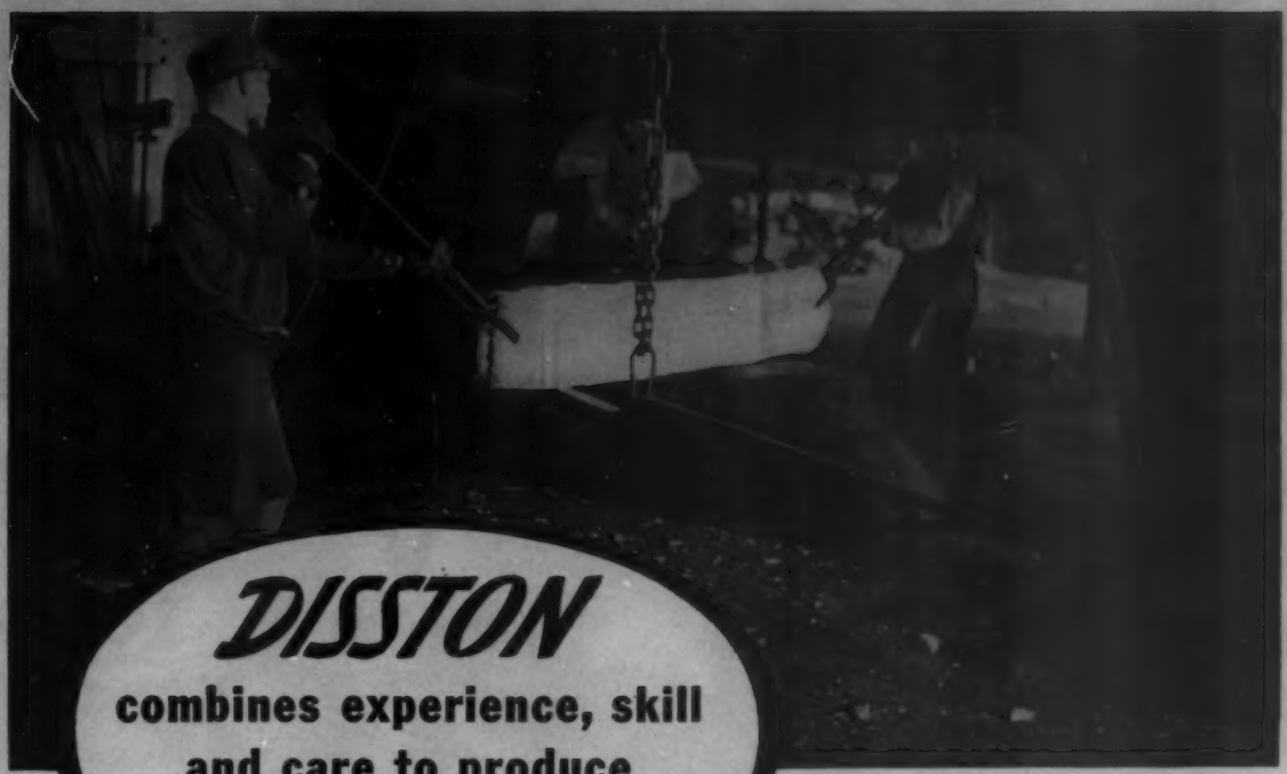
The table, center, below, indicates segregation for different ladle carbon analyses. The ladle tests were killed with aluminum.

These analyses were selected at random from hundreds of crop segregation tests and readily indicate the variation to be expected in rimmed steel. The top crop-middle test will vary over wide limits depending on the condition of the sample; at this location the carbon increases with a greater number of blowholes. The segregation will vary with the general condition of the steel in the furnace. The better refined heat will segregate to a lesser degree and vary with pouring practices as well as with different size molds.

Reacts to Box Annealing

Relation of segregation to physical values or the ultimate performance long has interested steelmakers. No noticeable difference in physical properties are found when the carbon in the finished steel is 0.03 to 0.06 per cent. Steel of this grade readily responds to normal box annealing or, in the case of hot mill sheets, to the long treatment, i.e., normalizing and box annealing. Hot-rolled strip made from this grade and finished at the proper temperatures will possess suitable physical values[1].

A few years ago, steel with varying physical values either was diverted to a lower grade specification or retreated at considerable cost. Hot-rolled sheets for extra deep drawing were given a normalize, pickle, one or two cold roll passes for flattening and a box anneal. After the full treatment the top portion of the box frequently was found to be granulated and was returned for complete retreatment; the bottom section of the



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One of the high grade Disston Tool Steels of special note is MANSIL—a deep-hardening, non-deforming, uniform manganese-chromium-tungsten alloy steel with excellent machinability. Use Mansil for intricate tools and wherever varied cross sections must be deeply hardened.

Experienced help for tool-makers: Disston metallurgical engineers will be glad to help you select tool steels for best performance and longest tool life . . . If you have not received your *free* copy of the illustrated 73-page book, "Disston Tool Steels," write today to Henry Disston & Sons, Inc., 926 Tacony, Philadelphia, Pa., U. S. A.

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At your request, Disston will supply you with Instruction Cards on six different types of Tool Steels. The Cards contain valuable information to help you get better tool performance, reduce breakage, and conserve essential materials. They are supplied *without charge* as part of the Disston Conservation Control Plan.

annealing charge sometimes was badly under-annealed and was returned for a re-annealing; and only the midsection was applied to the respective order. Even this latter portion of the batch lacked uniformity.

At one plant sheets were withdrawn from the annealing furnaces having a rockwell hardness, B scale, from 20 to 65 and the ductility just as variable. But with the advent of cold reduced strip many producers discarded the old theory that segregation was the sole cause of these variables and that it exerted little influence in normalizing and annealing practices. However, cold-reduced strip is charged direct to the box annealing furnace either in coils or sheared lengths so that with uniform annealing the charge is soaked thoroughly above pre-established annealing temperatures. No granulation is encountered with normally processed cold-reduced strip because heavy reductions overstrain the metal. Only when the material is critically strained will excessive grain growth be encountered. Cold strip is annealed at temperatures several hundred degrees higher than hot mill sheets formerly were subjected in the normalizing process.

Experiments with the use of "green" wooden blocks in both rimmed and killed grades of steel disclose little information. In some cases wooden blocks were placed in the mold before starting the pour which in other cases were placed on top after the ingot was filled. In both instances vigorous reactions took place but invariably this practice tended to promote or increase the tendency of thin-skinned ingots and to add porousness to the upper area of the ingot to the extent that normal top croppage would not eliminate it.

Wooden Block Detrimental

Fig. 2 illustrates a split ingot treated by placing the wooden block on the stool. This heat was of 0.08 per cent carbon and 0.31 per cent manganese having 15 pounds of aluminum added to the ladle for deoxidation. The aluminum in this case was too much and the ingot grew about 3 inches. Honey-comb blowholes extended along the two edges and higher up in the ingot. This is a poor ingot and cannot be heated right.

With killed steel the use of wooden blocks has a detrimental effect in that it benefits the top pipe somewhat giving a solid top section but driving the pipe lower in the ingot or promoting extensive secondary piping.

Green piles (tree saplings) frequently are used for puddling the top of both rimmed and killed steels. In the case of rimmed steel it has little or practically no value. But with killed steel it has many advantages. Metal is poured to the base of the hot top when such is employed, then puddled. The adjoining ingot is poured and again puddled and the process continued until the whole heat is poured. The system should be worked out according to the size of ingots as to whether one or two ingots are filled to the base of the hot top before refilling the hot top of the first. Where hot tops are not used the same practice should be employed leaving the metal lower in the mold and back pouring a header, in which event the top of the mold itself is utilized as a hot top.

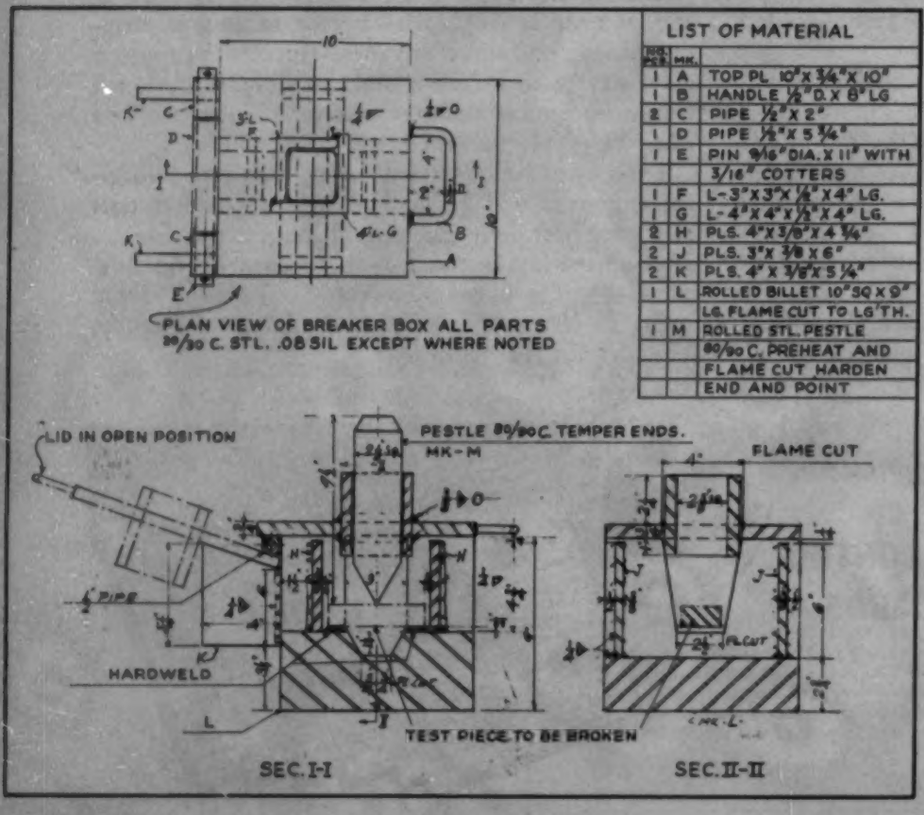
The use of green poles are most advantageous in the risers for steel castings especially in casting mill rolls.

(Continued Next Week)

Inexpensive Box Affords

SAFE BREAKAGE OF TEST SAMPLES

Plans for building an arc-welded breaker box for fracturing iron and steel test pieces


PLAN VIEW OF BREAKER BOX ALL PARTS 80/90 C. STL. .08 SIL EXCEPT WHERE NOTED
LID IN OPEN POSITION
PESTLE 80/90 C. TEMPER ENDS.
MK-M
FLAME CUT
HARDWELD
TEST PIECE TO BE BROKEN
SEC. I-I
SEC. II-II

LIST OF MATERIAL

REQ. PER	MK.	
1	A	TOP PL 10" X 3/4" X 10"
1	B	HANDLE 1/2" D. X 8" LG
2	C	PIPE 1/2" X 2"
1	D	PIPE 1/2" X 5 3/4"
1	E	PIN 9/16" DIA. X 11" WITH 3/16" COTTERS
1	F	L-3" X 3" X 1/4" X 4" LG.
1	G	L-4" X 4" X 1/4" X 4" LG.
2	H	PLS. 4" X 3/8" X 4 3/4"
2	J	PLS. 3" X 3/8 X 6"
2	K	PLS. 4" X 3/8" X 5 1/4"
1	L	ROLLED BILLET 10" SQ X 9" LG. FLAME CUT TO LG'TH.
1	M	ROLLED STL. PESTLE 80/90 C. PREHEAT AND FLAME CUT HARDEN END AND POINT

SAFETY is forefront in all production programs today. For instance, here is a breaker box built by arc welding which has proved its worth in the safe breaking of samples at open-hearth shops and blast furnaces.

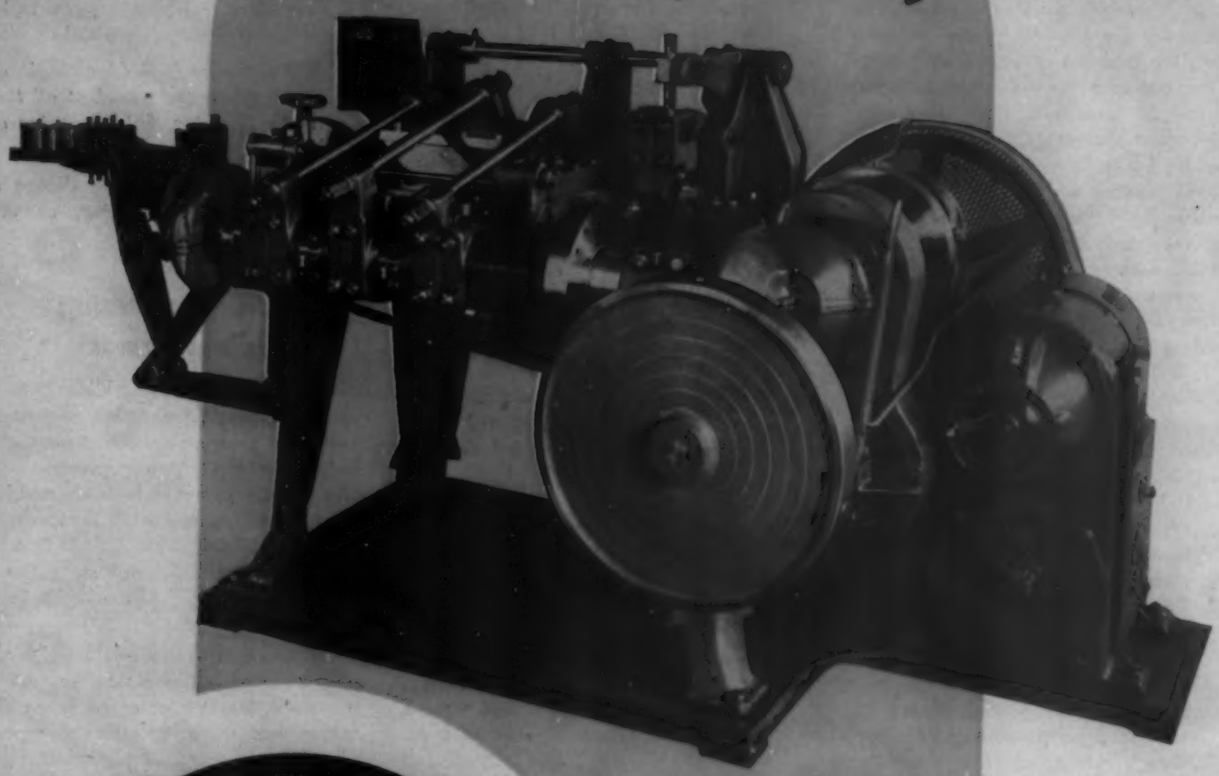
Test pieces usually are taken from each heat that is made. In many plants, the test piece, measuring about 2 x 1 x 5 inches, is placed on an open block and broken with a heavy sledge. These test pieces must be made for observation of structure—also for laboratory use. When the test piece is handled in this manner, broken pieces of steel fly in all directions—many times causing bruises, broken teeth, and serious eye injuries.

The accompanying drawings, by courtesy of Hobart Brothers Co., Troy, O., are complete plans for building a safe breaker box by arc welding. When using this box, the operator places the test piece in a closed compartment; strikes the pestle with a sledge; and the test piece is broken safely inside the box. The breaker box, built according to these plans, costs only $20.

Plans for the box were submitted in Hobart's arc welding contest by M. Earl Lohr, planning engineer, Bethlehem Steel Co., Johnstown, Pa.

NILSON

automatic metal wire forming machine



The Nilson line includes machines for forming paper clips, buckles, gate hooks, coat and hat hooks, ceiling hooks, wire ears, cable rings, screw eyes, sash chains, automobile slide chains, flat open link chains, staples, cotter pins, hose clamps, etc. Nilson also makes wire straighteners, wire reels, frame bending machines and special presses.

The machine pictured here is a simple and ingenious contrivance. Sturdy, solid, compact, requiring little space, it is a highly efficient and practical machine for forming wire and punching patterns from ribbon stock. Various patented features and extra attachments make it a necessary factor in reducing the manufacturing cost of your product. The Nilson automatic metal wire forming machine turns out the work faithfully, accurately and speedily—and it functions a long, long time free from repairs and replacements.

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BRIDGEPORT, CONN.

RECOMMENDED GRINDING PROCEDURE

For Wet or Dry Hand Grinding Carbide Tools

WITH THE tremendous increase in useage of carbide tools to speed production under the impetus of the war program, the problem of establishing proper grinding techniques for such tools has become of immediate importance.

Incorrect grinding may sacrifice a considerable portion of the increased output per machine and per man-hour, made possible by carbide tools, by necessitating more frequent shutdowns for tool changes with resultant loss of time.

Some worthwhile "tips" on the procedure to follow in wet or dry hand grinding of these tools are outlined here by J. R. Longwell, factory manager, Carboloy Co. Inc., Detroit. These recommendations are supported below by illustrations, and are as follows:

Roughing: Using 60-grit silicon carbide straight wheel.

1. Rough top face. Rough grind top face of the tool, leaving about 1/32-inch land at the cutting edge.
2. Rough front relief (front clearance). Set table at 4 degrees greater than finished relief angle desired at the cutting edge, rough grind the front secondary relief, leaving about 1/32-inch land at the cutting edge.
3. Rough side relief (side clearance). Leaving table at 4 degrees greater than finished angle desired, rough grind the side secondary relief, leaving about 1/32-inch land at the cutting edge.

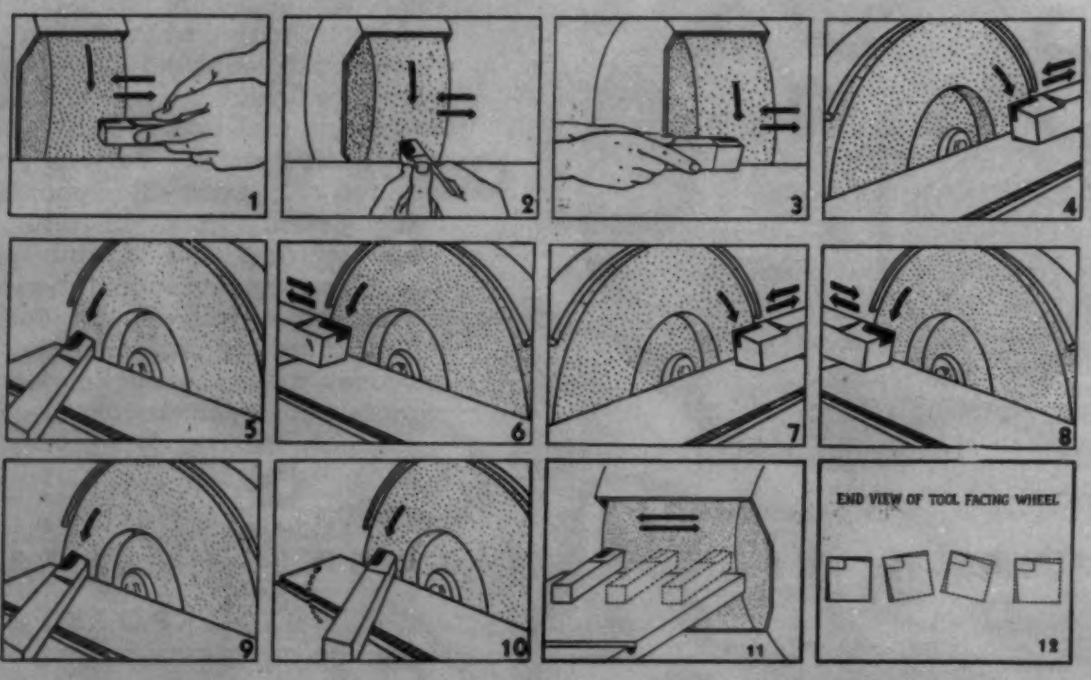
Finishing: Using 100-grit crown face cup wheel or 100-grit diamond wheel.

4. Finish top face. Set table rest at the finished top face angle desired. Finish grind top face of tool.
5. Finish front relief (front clearance). When continuing from operation No. 4, reverse motor and use other side of wheel so wheel will revolve against cutting edge of carbide tip. Set rest at finished angle desired. Finish grind front relief of tool.
6. Finish side relief (side clearance). Leaving table rest at finished relief angle desired, finish grind side relief of tool.

Lapping: Use 220-grit diamond wheel or a silicon carbide wheel.

(*Advisable on tools used for precision boring, facing and turning and for tools used for machining aluminum.*)

7. Top face. Set table rest at finish top face angle desired, lap the top face. (Note: When grinding on top face is necessary, it should always precede grinding on side or front relief.)
8. Side relief. When continuing from operation No. 7, reverse motor and use other side of wheel so wheel will revolve against cutting edge of the carbide tips—that is, from tip to shank. Set table rest at finished relief angle desired (usually 1 degree less than under operations 5 and 6) and lap the side relief.
9. Front relief. Leaving table rest at finished angle desired, lap radius on nose of tool. Using light pressure, slowly describe a free-hand arc. If necessary to repeat, remove tool to different position on wheel.
11. *Keep the tool moving back and forth across the wheel at all times while roughing, finish grinding and lapping.*
12. *Keep the tool rocking during the roughing and finishing, as illustrated below.*



American Engineering Standardizes Pumps

American Engineering Co., Philadelphia, announces completion of a standardization program on sixteen sizes of its Hele-Shaw fluid power pumps. This move affects pumps in both low and high pressure ranges, including pump capacities of 0.25, 0.4, 0.75, 1.5, 3, 6, 9, 12 and 18 in the high pressure series, of 0.25, 0.4, 1.5, 4, 7, 12 and 18 in the low pressure series.

The standardization enables the company to increase production, improve deliveries in the face of procurement difficulties, and make replacements of completed units and replacement parts available promptly, it is reported.

Air Conditioning for a rivet

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Silly? To air condition rivets? Not at all. When aluminum rivets are cooled to sub-zero temperatures they can be riveted faster and more perfectly . . . *speeding up airplane production.*

Many of us think of air conditioning only in terms of comfort for human beings. Yet today, air conditioning's most important job is to keep the *machines* and *materials* of war industry at desired temperatures and humidities.

To meet these wartime needs, revolutionary advances in air conditioning technique have been made. Temperature and humidity are maintained *far more exactly* than ever before. Equipment is more compact, more flexible.

With the coming of peace, this experience will be applied to the making of improved air conditioning equipment for all sorts of uses.

Packaged air conditioners will be smaller, more compact, more economical—many more homes will have them. And in offices and factories, air conditioning will lower costs and increase efficiency. General Electric will be a logical source of all types of this new equipment for air conditioning, refrigeration, heat transfer and heating.

Air Conditioning and Commercial Refrigeration Department, Division 422, General Electric Company, Bloomfield, New Jersey.

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Established 1923

10 Howard Street, Buffalo, New York

Fig. 1—This building, approximately 200 x 245 feet, cost only $2.21 per square foot. Its steel framework is an arc welded rigid-frame structure

How To Cut

Structural Steel Requirements

By 40 Per Cent

By F. W. METTLER
Consulting Structural Engineer
4004 Bluestone Road
Cleveland Heights, O.

AN IMPORTANT tonnage of structural steel could be saved in new single-story plants and plant additions if the steel frameworks were designed for welded rigid-frame construction and if wood purlins were utilized instead of steel purlins.

Some idea of the amount of steel which could be saved in this manner can be had from noting that for buildings of the type shown in the accompanying illustrations, conventional truss structures with steel purlins require approximately 8.4 pounds of steel in the frames for every square foot of building area. By changing to wood purlins about 2 pounds per square foot is cut from this weight, reducing the total to about 6.4 pounds of steel per square foot of building area. Then by changing to welded rigid-frame type of structure, an additional 20 per cent can be saved since this type of building can be constructed with only about 5 pounds or less of steel in the framework per square foot of building area.

If, however, steel purlins are used, an economy in weight of steel in the purlins can be gained by designing them as continuous over trusses or frames—they may be welded or bolted in the field. This may save 15 to 25 per cent of the purlin weight. Also in beam construction, great economies may be obtained by taking full advantage of continuity in design.

In addition to these important economies in a material which is daily becoming more difficult to obtain, even with high priorities, other economies accrue since the shop fabrication and field cost on this type of building are much lower than on conventional constructions. As of July 1, 1942, fabricated and erected structural steel prices were approximately as follows: Buildings with roof trusses, $150 per ton; all beam conventional design, $140 per ton; all-welded design, $120 per ton. Field welding on the building shown was sublet for the sum of $350 or $3.18 per ton of steel used.

The building illustrated provides new storage and shipping facilities for the Commercial Bookbinding Co. at West 110th street and Western avenue, Cleveland. The 1-story structure measures 200 feet by 244 feet 9 inches. Outside walls are 13-inch brickwork, the sides fronting on the two streets having a light gray face brick with black terra cotta trim and stone coping.

Roof construction is a 2-inch planking on 6 x 12-inch wood roof joists and 4-ply asphalt roof covering. Floor construction is 5-inch concrete reinforced with 6 x 6-inch steel wire mesh.

The steel framework is an arc-welded rigid-frame structure with roof beams being placed on an incline to form a lean-to. One end of the lean-to has a vertical face to permit the use of regular sidewall sash instead of the more expensive monitor sash.

Foundations were designed for a soil pressure of 4000 pounds per square foot. Column bases are encased in the 5-inch concrete floor slab, thus assuring fixed end conditions in designing the frame. The soil is hard clay.

Cost of this building was $2.21 per

Fig. 2—Steelwork in course of erection. Note extreme simplicity of framing

Fig. 3—A more clean-cut appearing interior would be hard to imagine

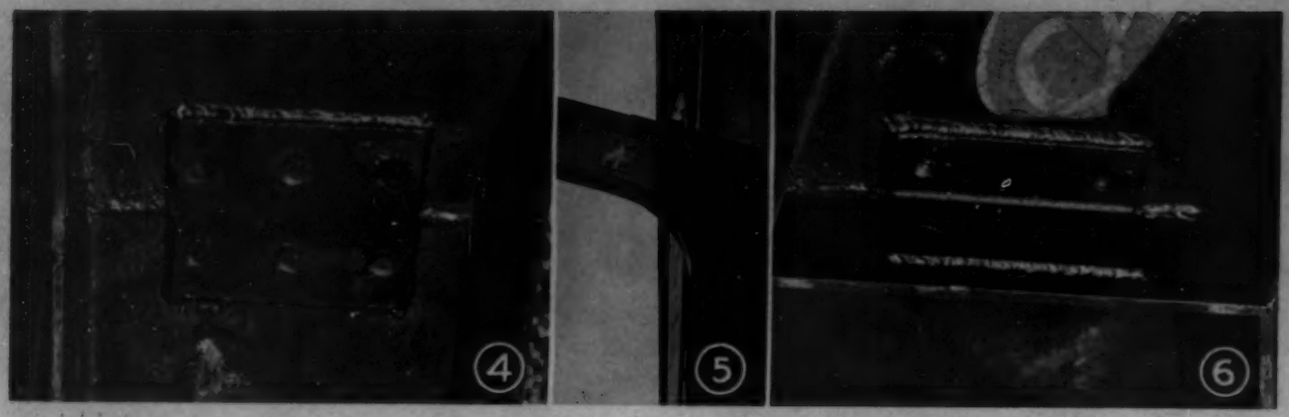


Fig. 4—Small tie plates were used to hold sections in place by means of bolts till welding was completed. Then bolts were removed, holes plugged with weld metal

Fig. 5—Column sections were standard H-sections with a specially fabricated knee inserted as shown here

Fig. 6—Tie plates were used for shop as well as field erection

square foot, which included all mechanical trades as well as the sprinkler system, which was extended from the main building across one of the streets. This cost was based on prices as of January, 1941, and would have to be modified to meet today's prices.

The use of wood purlins in addition to lowering the amount of steel required makes possible further economies by eliminating the considerable amount of work involved in bolting wood nailing strips to steel purlins, which would have been necessary had steel been used. This not only contributed to the cost saving but also was a factor in speeding the construction of the building.

As mentioned previously, shop fabrication and field erection costs on this type of building are much lower than for conventional construction using truss-type members. In truss work there are a large number of various details to be cut, laid out and punched, then assembled and riveted to complete the finished member. In welded design, the rafter can be an ordinary rolled section with simple punching for field erection and purlin clips, while the columns are also plain rolled sections with the knee welded at the top for the future rafter connection.

By referring to the accompanying illustrations it will be noted that small tie plates were arc welded to the column sections with bolt holes for attaching adjoining members. These tie plates were used for shop as well as field assembly after the members had been assembled and lined up. A weld bead was run around the tie plates after this had been done. Then the welding of the flanges and web was completed, the assembly bolts were removed and the holes filled with weld metal.

Note the tall column sections are made of standard structural H-sections to which are welded special sections which form the knee, on top of which is welded a similar H-section to complete the column.

The amount of steel used in the building illustrated was 110 tons or 4.5 pounds of steel per square foot of building. A conventional type building recently handled by the writer, of very simple beam and column design, using wood purlins and with spans closely conforming to the building illustrated, weighed 5.6 pounds of steel per square foot, which is a saving in weight of 20 per cent in favor of the welded design. Due to the simplicity of design of the welded frame the cost of preparing drawings is very low, 32 hours being used in making shop drawings for the building illustrated, which is but 36.3 cents per ton.

This building is composed of six spans 33 feet 10 inches long and one 39 feet 2 inches. In the first six spans, 14-inch 30-pound wide flange beams were used for rafters and columns, and in the seventh span 16-inch 36-pound wide flange beams were used. The knees were made of plates welded together of the same thickness as the webs and flanges of the beams.

To sum up, in welded design, there are no knee braces or other longitudinal bracing needed as in truss design. We do not have trusses to interfere with placing of machinery or other equipment, lighting, ease of painting and general maintenance against corrosion.

Dunbar Co., Cleveland, was general contractor on this job. City Iron Works Inc., Cleveland, was the fabricator. The writer served as the architect and engineer.

HOW TO IMPROVE YOUR WELDING

STEEL'S latest wartime handbook is now ready. Arranged in eleven sections, the seventy-two chapters contain two hundred pages—a selection of STEEL'S outstanding material of the past two years, including E. W. P. Smith's excellent series of fourteen articles "How To Get the Most from Arc Welding"; plus "Weldability"; "How To Keep Welding Machines Welding"; "Conserving Electrodes", and over 50 others.

"How To Improve Your Welding" is available at once at $2.00 per copy. Please send your order to STEEL, Readers Service department, Penton building, Cleveland. On orders originating in Ohio please include 3% sales tax.

Chemical Powder Repairs Cracks in Iron

A powerful chemical powder reported to waterproof masonry and repair cracks in concrete and iron is announced by Weather Seal Co., Dept. S, 10 East Pearl street, Cincinnati.

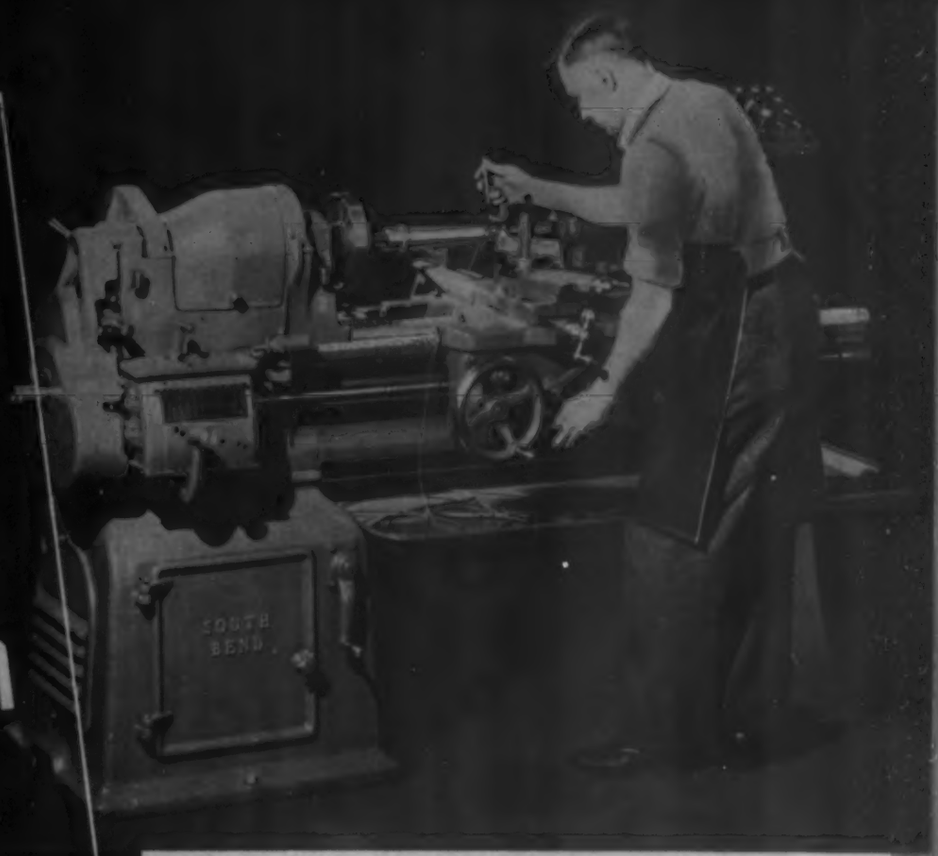
Called Drye, it is said to be equally effective for inside or outside use. It also can be used for hardening and waterproofing cement and mortar when included in the mix and is suitable for patching cement floors and bonding tile to cement.

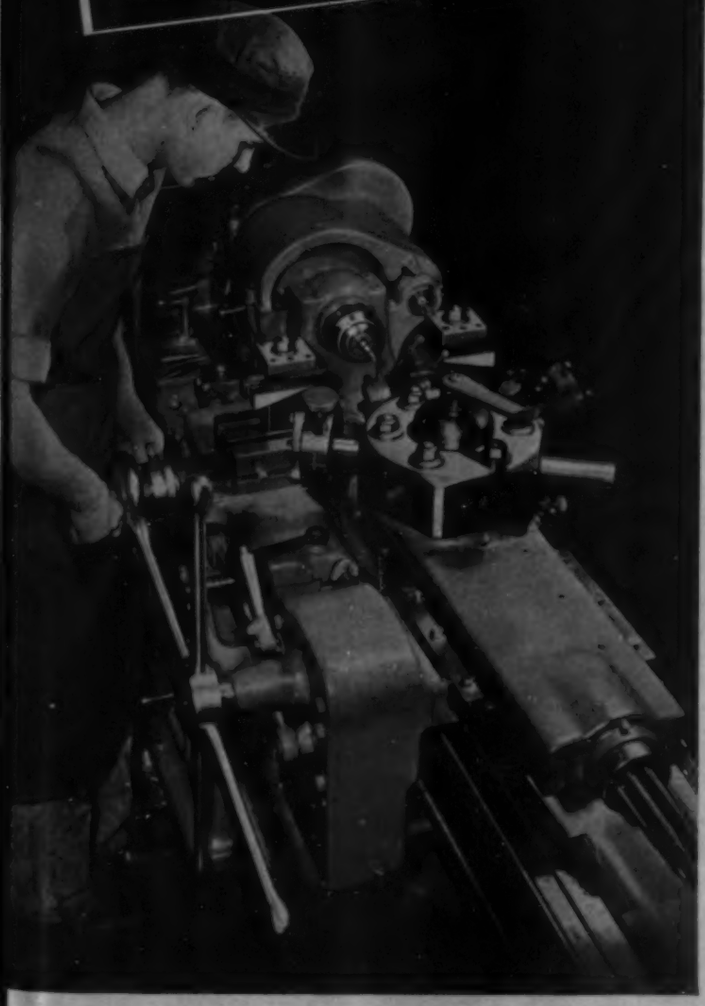
The powder, which is mixed only with cold water, also repairs cracks in iron and can be used as a furnace cement.

In paste form when applied, the product can be readily brushed or troweled on the walls or surface to be waterproofed. Only one application is required for outside work; two coatings if applied inside.

The company also has available a colorless waterproofing, Liqui-Drye. This is scarcely visible where applied and is for porous types of masonry.

Matched for Production





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There is a practical size and type of lathe for every class of work. South Bend Engine Lathes and Toolroom Lathes are made in five sizes: 9″, 10″, 13″, 14½″ and 16″ swings. South Bend Turret Lathes are made in three sizes: No. 2-H, Series 900, and Series 1000. Write for a copy of our new Catalog No. 100B in which the entire line of South Bend Lathes is illustrated and described.

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Fig. 1. (Above)—Assembling tilt motor after servicing. Fig. 2. (Left, center)—Chucking operation of tilt motor clutch. Fig. 3. (Left, bottom)—Adjusting brushes while servicing tilt motor

MAINTAINING....

Battery-Powered Industrial Trucks

By F. L. SAHLMANN
Transportation Department
General Electric Co.
Schenectady, N. Y.

BATTERY - POWERED industrial trucks, possibly because of their ability to operate longer without proper maintenance than most similar equipment, are often neglected to the point where their normal span of usefulness is seriously impaired before they are finally inspected and overhauled.

Today, such negligence is inexcusable. No previous emergency in the country's history has necessitated the rigid maintenance of industrial equipment that must be employed now because replacement equipment is almost impossible to obtain. Thus what we have must be kept working.

Regular inspection and overhauling are the only positive guarantees of the continuous, efficient performance demanded by the 24-hour-a-day, 7-day-a-week production schedules now so common. The following suggestions, then, are designed to facilitate the care and maintenance of the electrical end of this important piece of equipment:

General Precautions: The batteries, sole source of propulsive energy, should be inspected and serviced at regular intervals, according to the recommendations of the battery manufacturers. Any replacements required should be made without delay.

Both the traction motor, which propels the truck, and the hoist motor, which drives the pump on trucks equipped with hydraulically operated hoist and tilt mechanisms, or the gear box on gear or chain drive hoist and tilt mechanisms, should be inspected monthly and overhauled approximately once a year.

The controller, the commutator, the contactor, the accelerating resistor and all allied parts also should be inspected and overhauled at like intervals.

Naturally, local conditions and the skill of the operator will dictate the frequency of inspection and overhauling.

Traction Motor—Monthly Inspection:

—Remove dirt from commutator cover and surrounding parts to prevent it from falling into the motor.

—Remove commutator cover and examine mechanism, noting that copper surface has a smooth polished appearance and is free of copper beads and grease.

—See that the brush-holder mechanisms seat on brushes and that shunts and terminals are tight.

—Wipe carbon dust from cables and brush holders.

—Remove dirt from brushes by lifting springs and raising and lowering

brushes in the carbon ways. Do not snap the springs as this may chip the brushes.

—Replace short or broken brushes with new ones of the proper grade. If only partial replacement is made, grind new brushes to same length as the other brushes in the motor.

—Inspect connections for tightness.

—Examine the interior of motor for charred or broken insulation or other injuries and replace damaged parts.

—Replace commutator cover.

Traction Motor—Annual Overhauling:

—Remove motor from truck and clean it on the outside.

—Remove commutator cover and raise the brushes from the commutator to avoid damaging them.

—Remove the nuts from the studs at the pinion end of motor and withdraw the armature complete with commutator —end bearing assembly and pinion end framehead assembly through pinion end. Important: To obtain maximum life from bearings, they must be kept free of dirt. Therefore, when bearing assemblies are removed from motor, keep them covered.

—Remove the pinion-end assembly and commutator-end bearing assembly from armature, employing suitable puller.

—Blow out dust and dirt from armature, using clean DRY compressed air and wipe clean of oil and grease with a cloth saturated with carbon tetrachloride.

—If armature is found in good condition, proceed as follows:

—Bake at least 12 hours at 120 degrees Cent. (250 degrees Fahr.)

—While hot, paint with a varnish such as Glyptal No. 1201. Paint the string beads but take care to keep the commutator clean.

—Bake for twelve hours at 120 degrees Cent. (250 degrees Fahr.) (Note: If it is found necessary to remove armature coils due to grounds, short circuits, or other damage, it is recommended that the complete armature be sent to the nearest service shop for repairs and rewinding.)

—Take out the cap screws at the commutator end and remove the framehead.

—Blow out the interior of motor with clean DRY compressed air and wipe clean of any oil and grease with carbon tetrachloride.

—If field coils are tight and in good condition, paint them with varnish such as Glyptal No. 1201. Also, paint the interior of the motor with varnish, using care not to get any varnish on the pole-piece faces. Otherwise, remove field coil as follows: Disconnect the cables and remove the cap screws holding field piece to frame. Then slide out the pole and coil through end of frame and slip coil off pole. Keep each pole, coil and any accompanying shims together. Upon reassembly, parts should be returned to their original position. Use new lock washers with pole-piece cap screws. Make sure that contact surfaces are clean, cables are properly reconnected and cap screws drawn up tightly. Check the coil polarity. Guard against loose connections at all times.

—Remove dust and dirt from brush holders and cables with carbon tetrachloride.

—Note that brush-holder mechanisms operate properly; that brushes are free in carbon ways; that shunts and terminals are tight and that carbon ways are not rough or worn. Brushes should never be allowed to wear so short that the pressure arm of the levers rests on the top of the brush-holder carbon way instead of on top of the brush. All brushes must have the same length to obtain an even distribution of current. (Note: New brushes may be fitted to the commutator brush holder by placing a strip of fine sandpaper between the end of the brush and the commutator with the rough side of the sandpaper against the brush.)

—Pole-piece cap screws must be tight and locked with lock washers.

—Reassemble parts on armature. When replacing bearings, use a suitable brass sleeve so that the pressure will be on the inner race of the bearings.

—Reassemble armature in frame, putting in new brushes if necessary.

The commutator should never be lubricated since the brushes contain sufficient lubrication. A dirty and greasy commutator will collect carbon dust in the grooves between the segments. This condition will cause a short circuit. The commutator should be kept smooth and concentric with the armature bearings. If the commutator brush surface should become rough, burned, pitted or excessively worn, the armature should be placed in a lathe and the copper turned down just enough to give a true surface. The mica between the copper commutator segments is undercut to 3/64-inch below the copper brush surface on new commutators and should be undercut as often as necessary to prevent the mica from becoming flush with the copper brush surface. Slightly round all sharp edges on the copper segments after turning or undercutting and remove all chips, sharp edges and copper dust from the grooves between the segments. Care must be taken to prevent the copper chips and dust from lodging in the armature winding while reconditioning the commutator by using a suitable head covering over the end windings.

Pump Motor—Inspection and overhauling:

The same procedure suggested for the inspection and overhauling of the traction motor should be followed in the case of those industrial trucks equipped with a motor-driven gear-and-chain or hydraulically operated hoist and tilt mechanism, except for the differences in the method by which the motor is removed or opened.

Details vary according to the particu-

Fig. 4—Sectional view of typical traction motor for battery-powered truck

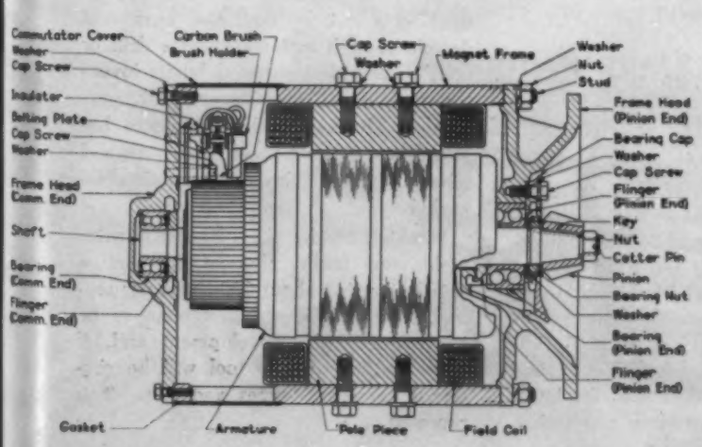
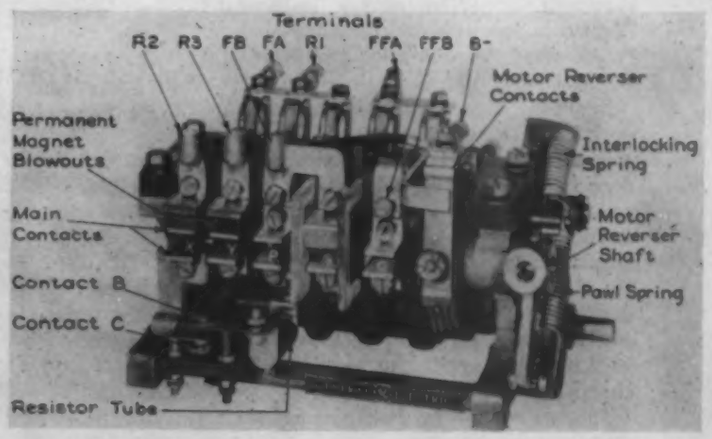
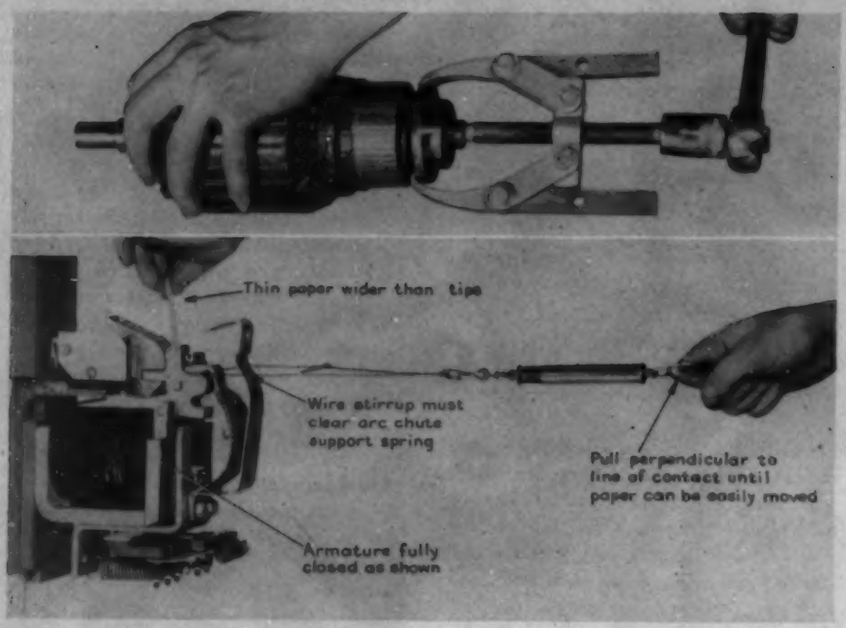


Fig. 5—Typical motor controller and reverser for battery-powered truck





Thin paper wider than tips
Wire stirrup must clear arc chute support spring
Pull perpendicular to line of contact until paper can be easily moved
Armature fully closed as shown

Fig. 6. (Left, above)—Approved method of removing ball bearing from shaft

Fig. 7. (Bottom)—Recommended method of measuring final contact-tip pressure on electric control contactor as used in battery-powered trucks

lar type of truck involved, but in general it is necessary first to disconnect the coupling between the motor and the pump. The mounting screws may be differently located, but an inspection will make it readily apparent what changes need to be made in the routine as already mentioned in connection with the traction motor.

The Controller:

—Blow out all dust and grit with clean DRY compressed air.

—If required, oil contact cam rollers through holes provided insulating support and oil reverser shaft bearing. Use an accepted lubricant in a long snout oil can.

—Replace any broken springs or shunts and check all connections for cleanliness. Tighten if loose.

—Inspect contact tips for cleanliness and wear and carefully remove any roughness on contact surfaces with a clean fine file. Contact tips worn half way through should be replaced.

—At yearly overhaul period, remove, clean and repack main shaft bearings with an accepted ball-bearing grease.

—Both the contact tip pressure and the tip gap (distance between the tips when the contactor is open) should be checked periodically.

Contactor should be inspected at the same time the controller is inspected, as follows:

—Use clean DRY compressed air to blow out dust and grit, being sure to blow out all metallic dust from contact points.

—Replace any worn or broken points.

—If the contact tips are badly burned, dress down with a fine file. (Do not waste contact metal.). Replace tips when worn halfway through.

—Inspect cable and shunt connections for loose or faulty electrical contact.

—Periodically check contact tip pressure and tip gap.

(Note: Specific information relative to coil operation and contactor adjustment should be obtained from the manufacturer.)

Accelerating Resistor:

—Blow out all dust and dirt with clean DRY compressed air and check all connections for tightness.

—Check both resistor ribbon and porcelain insulator for damage or breakage.

Proper maintenance of this important piece of industrial equipment will largely eliminate expensive breakdowns and replacements. To be effective any such maintenance program need but be based on the common-sense but often disregarded theory of preventing trouble before it starts. And it works.

Standard Deals with Spot Welding Aluminum

American Welding Society, 33 West Thirty-ninth street, New York, recently approved and published an emergency standard covering the spot welding of aluminum alloys in aircraft entitled "Tentative Standards and Recommended Practices and Procedures for Spot Welding Aluminum Alloys".

Result of nine months' concentrated work by a technical committee, the report consists of tentative recommendations for standards of weld quality and performance as well as general recommendations of the best practices and procedures to be followed in spot welding aluminum alloys in the aircraft industry. It also contains a general discussion of the theory of spot welding, particularly as applied to aluminum in aircraft.

Subjects covered by the report include standards of weld quality, surface preparation for spot welding, welding technique, methods of testing, methods of inspection, design of spot-welded parts, welding equipment and installation, as well as a short dissertation on personnel requirements and production methods. The standard is available from the society's headquarters for $1.

Publishes Lectures on Heat Transfer

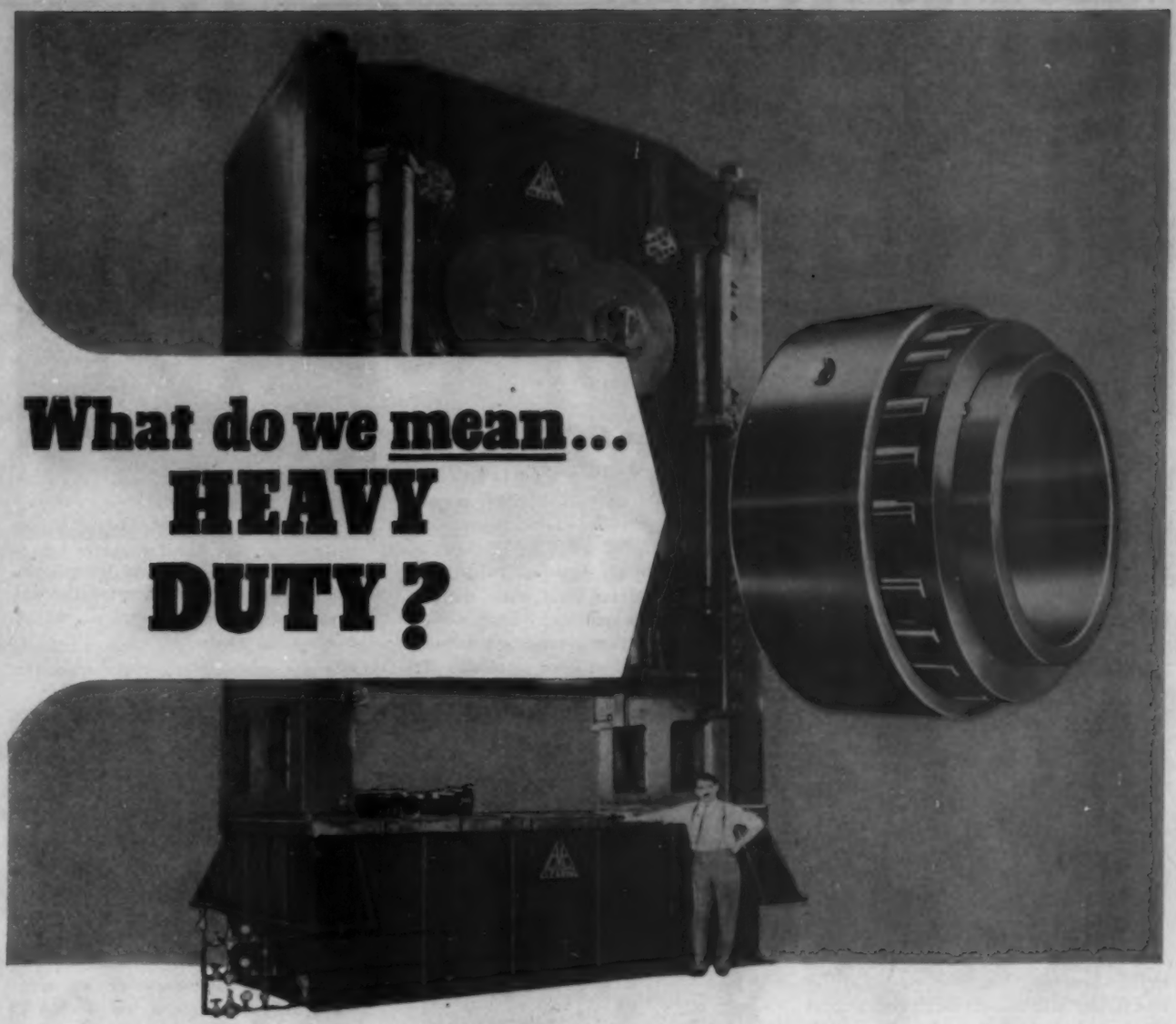
Heat Transfer by Natural and Forced Convection is the title of an engineering bulletin recently issued by the engineering experiment station of Purdue university, Lafayette, Ind. Identified as research series No. 84, the publication embraces a series of lectures presented at the university last April by Allan P. Colburn, professor of chemical engineering.

Lectures included deal with the introduction of convection, free convection, forced convection and applications to the design of heat exchangers.

Inventor Demonstrates Versatile Tool

An electromagnetic tool that can be used as a chisel to remove burs, and flexible enough to be used as a drill or polisher was demonstrated by its inventor, Jack Rowe, in Moscow, Idaho, recently. The tool, with refinements, has great possibilities in both war work and other industries, the demonstration revealed.

Working on the electromagnetic principle, the tool's plunger operates a chisel vibrating about 120 times per second. Several industrialists seem to be interested in the development and, if plans materialize, the tool will be produced in several types and sizes, it is reported.



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INDUSTRIAL EQUIPMENT

Polishing Brush

Osborn Mfg. Co., 5401 Hamilton avenue, Cleveland, announces a new polishing brush especially designed for use in conjunction with airplane engines and parts. Purpose of the brush

is to get into inaccessible places to reveal any possible scratches or cracks that may develop trouble later.

The brush is of tampico fiber. The polishing material used with the brushes is usually a very finely powdered alundum, fine enough to go through a 240-mesh screen, and suspended in a suitable pasty material. The brush does not impart a luster as high as that given by other polishing devices. The finish it provides is uniform.

Tool Holder

Lane-Wells Co., 5610 South Soto street, Los Angeles, has developed a tool holder said to cut tool changing time to approximately 5 seconds. It consists of a tool post which can be fitted to any engine lathe carriage compound rest.

Clamped into the tool post in a cyl-

indrical member are the detachable heads. The tool bits used for boring, turning, etc., are fastened into the heads. Drills and reamers also can be used here.

In practice the lathe operator has several heads each carrying a tool to perform a certain operation on the stock. The first is placed in the tool holder and locked in place by a quarter-turn of the control handle. As soon as the operation on the stock is performed by the first tool, the operator releases the head, replaces it with the second head, locks it in place and is ready for the next operation. If a particular tool must be removed and then reinserted in the tool holder, as for example when a particular working operation is interrupted by other work to be done, the tool holder permits the original tool to be reinserted in the tool holder in exactly the same position it originally occupied, it is said.

Fire Defense Unit

American-LaFrance-Foamite Corp., Elmira, N. Y., announces a 100-pound Alfite carbon dioxide engine for use on both electrical and oil fires. It also is equipped with an Anti-Statik horn to protect the operator from static charge. The unit features a third swivel wheel for easy maneuvering, and a retaining latch which releases horn instantly. It is recommended for fires in flammable

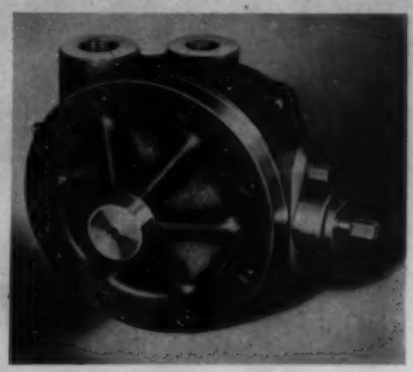
liquids, alcohol storage, electrical machinery, and for other class B and C fires. It is reported to smother fire instantly with carbon dioxide gas which expands upon discharge to 450 times its stored volume. The gas is noncorrosive, nonpoisonous and odorless.

Shock-Proof Pump

Hydra-Motive Inc., 253 St. Aubin avenue, Detroit, has introduced a redesigned vane-type, variable delivery pump which features heavier section reinforcing webs, conical instead of flat cover plate for increased resistance to shock, and standard mounting bracket. This is said to make the pump adaptable as a replacement for existing pumps, or as new equipment.

Adoption of standard mounting permits the pump to be used without changing current designs. Its delivery is infinitely variable from 0 to 4 gallons per minute with operating pressures of 1000 pounds per square inch with a top "short-interval maximum" of 3500 pounds per square inch.

To permit maximum selection of adjustment, a split stator instead of the conventional solid ring is employed. Ad-



justment and limit screws on the outside of the housing allow for varying the delivery to any amount required within the operating range.

Communication System

Executone Inc., 415 Lexington avenue, New York, has introduced an improved executive Monitor communication system consisting of two or more master stations connecting up to 19 remote stations. These can communicate with each other, or can carry on two-way voice-amplified conversations with remote desk or trumpet-type substations in outlying departments.

An interceptor control feature enables the assistant at the monitor station to intercept all incoming calls originating at the remote stations. Both executive and monitor stations are equipped with busy signals which illuminate to show when other stations are in use. The executive station, however, has the optional facility

of right-of-way busy stations for emergency use.

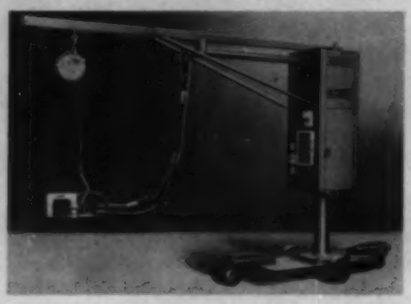
A paging button enables the user of any master station to call all other stations simultaneously, for paging and locating persons instantly, and for issuing emergency warnings or general announcements to the entire staff. Persons called

can reply remotely without leaving their work to approach the station. Power consumption for the entire system is only 46 watts.

Gun Spot Welder

Sciaky Bros., 4915 West Sixty-seventh Street, Chicago, announces a radical-type P-1-R gun spot welder capable of welding under steady production conditions corrosion-resisting steel, pickled steel, zinc-coated steel and Monel metal in thicknesses of 0.016 inch plus 0.016 inch up to 0.064 inch plus 0.064 inch. It will also weld two unequal thicknesses up to a total welded thickness of 0.500 inch, provided one of the two thicknesses does not exceed 0.040 inch.

Offered in both stationary and buggy-mounted units, it is equipped with a special welding timer and operates on single-phase alternating current, 220 or 440 volts. Hydraulic pressure is supplied by a hydro-pneumatic booster, which can feed a gun able to supply a maximum electrode pressure of 1800



pounds with 90 pounds per square inch air supply.

Fixed or crowded jigs can be reached easily with the portable buggy-mounted gun. The greatest possible area reached by the stationary unit is represented by a circle of 21 feet in diameter.

Secondary cables are thin, flexible and short; reduction in size is made possible because of the use of fixed heavy water-cooled copper bars in the length of the secondary circuit.

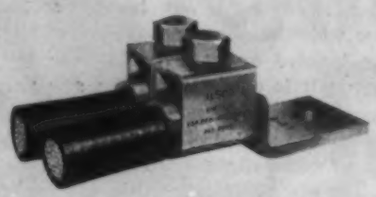
Fluorescent Circuit

General Electric Co., Nela Park, Cleveland, announces a new circuit for fluorescent lighting fixtures and a specially designed ballast control unit—a system said to make possible saving of millions of pounds of critical metals, and improving lighting efficiency.

The new circuit permits the use of only one ballast with four 100-watt fluorescent lamps. The two lamps on each phase of the new circuit start in sequence and operate in series. Thus, one ballast does the work of two, effecting economies in any fluorescent installation where the new circuit can be used. Although it is designed for use only with 100-watt fluorescent lamps and on 254, 265, and 277-volt circuits, many new war plants have this voltage available.

Solderless Connectors

Ilsco Copper Tube & Products Co., Mariemont, Cincinnati, has placed on the market their latest development in multiple solderless connectors. Two of these new multiple connectors now are available—LU4 which holds wires from



0 to 350,000 circular mils and LU6 which holds wires from 250,000 to 500,000 circular mils.

The connectors are simple in design, connections being made with a wrench or pliers. The connectors have ample contact area to carry sustained overloads, it is claimed.

Comparator Stand

Vard Inc., Pasadena, Calif., has placed on the market a Vard external comparator stand for checking rapidly outside diameters to close tolerances. Cast from a special fine-grained iron, it is slow to react to temperatures.

Unit weighs 30 pounds and any standard make dial gage fits the slide, which

travels on a fast acting Acme thread and slides on hand-scraped ways machined out of the casting. Set position is assured, after initial setting with gage blocks, by two lock screws.

A quick change of working tables is permitted by a large knurled screw in the base. The company is offering tables in the following dimensions: Four-inch diameter circle: 6 x 6 inches square and 6 x 12 inches rectangle.

Fluorescent Light

Lumidor Mfg. Co., Los Angeles, has introduced a new portable fluorescent service light adjustable from 30 inches to 7 feet and designed to project light into inaccessible places. It is being used by the Army for servicing planes at night and for indoor use to project light under the wings and fuselages of airplanes in an area which is invariably in shadow from overhead lighting.

Outdoors, the light is easily portable (merely tipped and rolled on its casters) and throws illumination in any direction —upward or downward, horizontally or vertically, or in any angle of a 180-de-

gree arc. The unit is adjusted without tools. A balanced cast iron base makes the light practically impossible to upset. Other features include power factor correction for the two 48-inch 40-watt flourescent lamps and a high-baked enamel reflector.

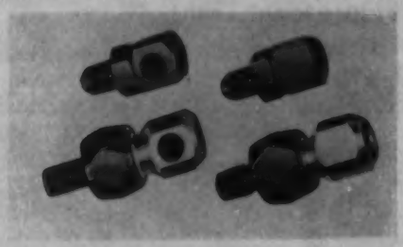
Angle Swivels

Trabon Engineering Corp., Cleveland, has introduced a new line of straight and 90-degree angle swivels for use in making oil, grease, air and other line connections between stationary, and revolving, oscillating or other moving surfaces. These are available in two different constructions for different requirements.

The standard ball-bearing swivels are available in ⅛, ¼, ⅜, ½, ¾ and 1-inch pipe sizes These units turn freely at any pressure without binding and should always be used if space permits. Light duty swivels are built without bearings. They are for use only in lighter work where space limitations do not permit

the use of ball-bearing swivels.

Both are furnished regularly with right hand threads in both head and stem. Swivels with left hand threads in either



the head or stem, or in both head and stem, and swivels of special materials for handling corrosives, etc., can be furnished on special order.

Boring Mill

Yoder Co., Cleveland, has introduced an improved No. 3-A horizontal boring mill which operates on a different power principle, providing the operator with "power touch control" in which the touch and turn of the hand control replaces gear shifting levers. It causes the positive power flow drive to put every allowable amount of power on the tool. Also, feeds may be set to a maximum without limitations of step gears.

Another feature of this power principle includes quick stopping obtained by dynamic braking which is quick and shockless. The power flow drive embodies all advantages of a variable speed direct-current system from an alternating-current source.

Torque output compares favorably

and to advantage over older types of drives and is applied directly without a large number of intermediate speed change devices. The machine also has a wide range of speeds—16:1 speed variation on spindle and feed.

Fleet-Fillet Electrode

Lincoln Electric Co., 12818 Coit road, Cleveland, has introduced a new Fleetweld 11 arc welding electrode for use with the Fleet-Fillet technique of arc welding. It is reported to be a fast flowing electrode, providing deeper penetration of metal into the root of the joint.

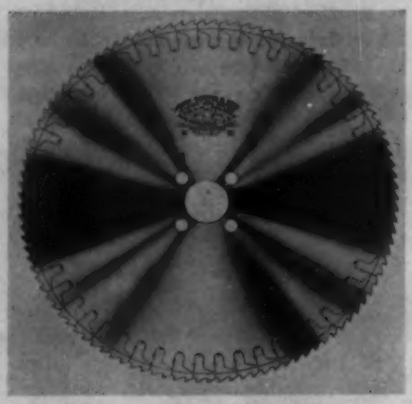
Of the shielded arc type, it is heavily coated to exclude oxides and nitrides from the weld. The electrode is held at an angle of 45 to 60 degrees with the horizontal plate, and 90 degrees with the electrode path along the joint.

Arc produced is so short, the electrode coating practically touches the metal, it is said. Designed to complete a weld in one pass, the electrode is made in 18-inch lengths and two diameters, 1/16 and ¼-inch.

Inserted Section Saw

Henry Disston & Sons Inc., Philadelphia, is offering a new inserted section saw which combines advantages of both the inserted tooth and solid tooth type saws. It is a continuous rim saw with inserted sections rather than inserted teeth—one that can be readily sharpened on an automatic grinder.

The saw provides a maximum number



of teeth for any given diameter and cuts smoothly. It can be operated at speeds up to 5000 feet per minute. This design is said to permit a thinner blade and cutting edge to be used thus cutting a narrower kerf.

Design of inserts is such that cutting load is transmitted from each insert directly to the blade approximately at right angles to the resultant force, and not to adjacent inserts or to rivets. The full thickness of the blade extends to the extreme diameter, giving maximum support to the inserts.

The inserts are quickly and easily replaced should they be damaged. Special emphasis is laid upon the fact that it is not necessary to return this saw to the factory to have it refitted.

Magnifying Units

Boyer-Campbell Co., 6540 Antoine street, Detroit, has introduced four new Super Sight models adapted to close inspection, small parts assembly and precision machining. These are designated as Nos. 95ZC, 89ZC, 89U and 44ZC.

The first has two magnifying lenses (top lens 5 inches and lower lens 4 inches). The lower lens is adjustable, both being lighted separately. The No. 89ZC consists of one magnifying lens (5-inch diameter). It is suitable for inspection, small parts assembly and bench work. The third unit has one magnifying lens fitted with safety lens to protect magnifying lens when required. The fourth also has one magnifying

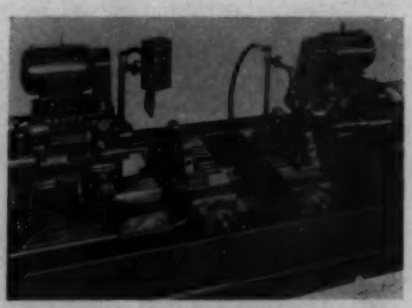
lens (4-inch diameter). All of the magnifying units are equipped so they can be used in any position.

Double End Milling And Centering Machine

Sundstrand Machine Tool Co., Rockford, Ill., recently introduced a new double-end milling and centering machine for milling to length and centering (in one handling) both ends of shafts ranging from 1⅛ to 6 inches diameter by 14 to 72 inches long.

Machine features a base of one-piece cast iron having horizontal ways. Crosswise to the bed ways are two subbases which, in turn, have ways on which cross feeding heads are attached. The left-hand subbase is fixed but the right-hand base is adjustable for handling various lengths of stock.

Mounted to the bed ways between the two heads are two screw-operated self-centering vises for holding the work. These also are adjustable for handling



various lengths. The drive to the heads is by means of a main drive shaft driven by a fluid motor. Each milling head of the machine is independently motor driven and carries a cam-operated automatic centering spindle.

In a cycle of operation the operator loads a shaft into the work holding vises. He then presses the cycle control

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NORTHWEST

4½ TO 40 TONS CAPACITY

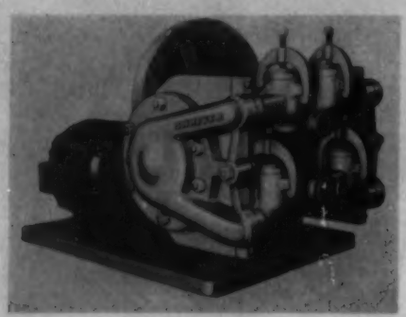
button which starts cross feed of the heads toward the front of the machine to mill both ends of the part to length. On completion of the cross feed for milling, the heads return toward the rear of the machine until the centering spindles are in correct position and then stop.

The centering spindles travel automatically longitudinally in a cycle of rapid approach, feed, rapid return and stop. The cycle is completely automatic so one operator can run several machines. Parts are handled but once thus the milling and the centering is in a definite relation and can be accurately controlled.

Diaphragm Pump

T. Shriver & Co., Harrison, N. J., has introduced a new design to its line of diaphragm pumps. It is a modernized top feed, bottom discharge unit which is adapted particularly for handling slurries or suspensions which contain a high percentage of crystalline or quick settling solids which may be corrosive, abrasive, heavy or valuable, delicate or hazardous.

The material is fed into the upper manifold of the pump through the ball valves and into the heads at each end of the



pump in a clean sweeping motion. This does not permit settling or accumulation of solids in the pump heads.

Positive displacement of the material is effected by means of double-acting pistons which are always immersed in a bath of lubricating oil. Since the working mechanism is separated from the liquid heads by rubber diaphragms, there can be no effect by the material on the mechanism.

Feature of the pump is the interchangeability of the valve manifolds so it may be fed from the bottom and discharged at the top. The pump is being offered in a complete range of capacities from 1 to 100 gallons per minute and for delivery pressures up to 100 per square inch and a suction lift as high as 18 feet.

Welding Gun

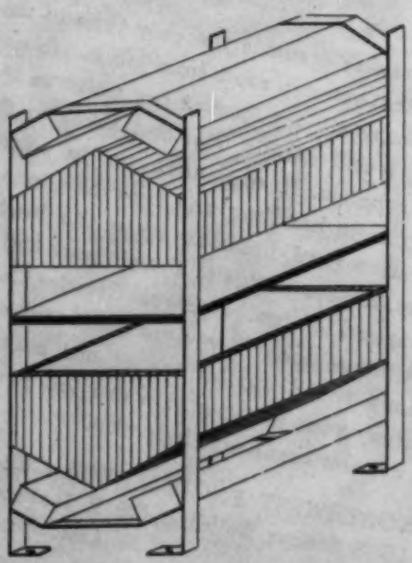
Progressive Welder Co., 3050 East Outer drive, Detroit, is offering a new welding gun for providing the light pressures required when welding brackets or clips to light gage alloy steels. The gun operating pressure is hydraulic with partially counter-balancing continuous air pressure. The latter also serves to retract automatically the points when hydraulic

pressure is released.

Features of the gun include screw-adjustable stroke (up to 3 inches) to take care of a wide range of work sizes, and quick interchangeable adapters for electrodes to use the gun for a wide variety of work shapes. Concentric, kickless and highly flexible welding cables and electronic controls are used in the complete assembly.

Infra-Red Expander

Infra-Red Engineers & Designers, 1633 East Fortieth street, Cleveland, is offering a new Duplex infra-red expander, capable of expanding roller, ball, taper, needle and other bearings, pistons, con-



DUPLEX EXPANDER

necting rods etc. to insure exact fit and easier assembly.

Parts to be "fitted" are merely placed on the unit's plate glass shelf where they are "showered" by uniformly distributed heat rays. Heater units of the expander are wired for 375-watt lamps. Temperatures at which parts are subjected may be controlled by adjusting distances of the heaters and the glass plate away from work.

The expander includes two V-type insulated-reflective heater units, (for top and bottom) 11 x 28 x 9 inches deep, wired. Both housings are insulated with compressed fiberglas 1 inch thick (except face and four 2-inch holes for lamps). The plate glass shelf is tempered shatterproof and heat-resisting. It measures 11 x 28 x ¼-inch. Detachable side reflector plates also are included although not always needed.

Alloy Sprayer

Alloy-Sprayer Co., 2040 Book building, Detroit announced a new self-contained, portable metal atomizer capable of spraying any neutral alloy which has a melting temperature of up to 600 degrees Fahr. for protective coating, reproducing like-

ness, etc. It is recommended for use in spotting or checking dies, reproducing molds and for making templets. It is said to be especially suitable where accuracy of reproduction is so fine that even pin scratches must be reproduced.

The sprayer requires only connecting-in with electric power and factory air pressure lines for operation. No special protection is required for the operator other than that there be adequate ventilation. Due to the peculiarity of atomized metal as deposited by this method, the operator doing the spraying can hold light weight work in his bare hands—without any danger of burning his hands.

The sprayer is of 12-cubic-inch capacity and it is equipped with electrical elements for heating the metal in the heavily insulated pot. Temperature control is variable to suit individual alloys over a range of 100 degrees by a rheostat switch.

A thermostat holds the metal at any pre-set temperature. Latch cover automatically seals top of pot against air leakage during spraying. Heating contents of the pot up to the melting point requires approximately 12 minutes.

Fighting with Ideas

(*Continued from Page 66*)

of a new endless cotton belt for a high-speed grinding machine. The new belt was 6 inches too long.

Tries Own Remedy: "I tried to shorten the belt by cutting it and gluing the ends together," he recalls, "but the glue repeatedly failed to hold. The problem interested me. I knew that metal fasteners would not be satisfactory in this case because of the vibration they would cause. It seemed there should be some way to make glue do the job.

"Keeping after the problem, I discovered a special waterproof cement we had never tried on belts that make the two ends of the cotton belt hold together."

Intrigued by the discovery, he obtained 50 feet of belt to continue experiments on his own initiative. Kholas' supervisors placed additional supplies and equipment at his disposal, and working with engineers assigned to this problem.

Max helped develop a method of cutting and gluing which enabled cotton-web belting to replace on many machines the leather belts then used by Westinghouse.

Result—longer life for belts, less production time out for machines, and reduction in the cost of belt maintenance. *When used on high-speed machines, the new cotton belts last at least twice as long as leather and cost only approximately one-third as much.* The cotton belts are more efficient and their use frees leather for war purposes, company engineers point out.

Machine Does More Work: The engineers also are taking their hats off to Albert Bachofer for showing them a way to make a machine building war equipment work 40 per cent faster.

Forty-one years a machinist with Westinghouse, this 62-year-old workman suggested a device to eliminate tool breakage and increase the production of rotors, essential parts of electric power generators.

His job is operation of a cutting tool which grooves deep, narrow slots in steel rotors for the insertion of copper windings. The magnetism that generates electricity is created in these windings when the rotor spins. Each slot is cut by moving the rotor back and forth for hours under the stationary tool—as though a carpenter were moving the board under his planer.

Like the carpenter's wood planer, the planer for steel cuts in only one direction.

On the return or back stroke, the planer tool formerly was dragged through the fresh cut, causing friction which slowed operations and often jammed or broke the tool.

Why not, Mr. Bachofer suggested, lift the cutting tool clear off the rotor slot at the end of the forward stroke so that its backward movement would be unimpeded? Adopting his idea, engineers designed an automatic lift. The veteran workman's reward for the time and material saving suggestion was $750.

Women Suggest, Too: Feminine ingenuity, too, has solved many production problems at Westinghouse. Consider the case of Miss Mary Gaslevich, who earned a $60 award for suggesting that Micarta (plastic) airplane pulleys be packed for shipment while some still were being tested, rather than beginning the packing after testing machines were stopped. This simple improvement avoided a "wasted" time interval of machine idleness.

A storeroom ledger clerk at East Pittsburgh, Miss Mary Gallagher, helped the company save war-important aluminum in the manufacture of a small lamp reflector used on electrical control apparatus. The aluminum casting, from which the reflector was fabricated, had been furnished by an outside supplier in

FROM VENEZUELA TO JERSEY CITY for THERMIT REPAIR..

This 9-inch diameter, four-throw Crankshaft broke in a Venezuelan plant. Knowing the speed and economy of the Thermit process, the management shipped the crankshaft over 2000 miles to Jersey City, where it was Thermit welded and re-shipped to South America.

For over 40 years, Thermit welding has been saving valuable production hours by putting large broken parts back to work in a few days—instead of the weeks or months needed to replace them.

Savings of several thousand dollars over replacement costs are not infrequent.

Thermit welding also has many advantages for fabrication of large, heavy parts. Preparatory work is simple, there is no manipulation or "positioning" and large, expensive castings are eliminated in favor of small forgings or flame-cut shapes.

Booklet, "Thermit Welding," sent on request.

Specialists in welding for nearly 40 years. Manufacturers of Murex Electrodes for arc welding and of Thermit for repair and fabrication of heavy parts.

THERMIT WELDING

METAL & THERMIT CORP., 120 BROADWAY, NEW YORK, N. Y.

ALBANY • CHICAGO • PITTSBURGH • SO. SAN FRANCISCO • TORONTO

a "standard size". When the casting was processed to produce the finished reflector, some aluminum was cut away as scrap. Not concerning herself with such matters as "standard " sizes, Miss Gallagher suggested that the supplier furnish a slightly smaller casting closer to the exact size of the reflector.

Engineers investigated and found that even though new machinery would be required by the supplier to cut the piece to the new size, the saving in aluminum would make the change advisable, Westinghouse, accordingly, furnished the new equipment and Mary Gallagher was rewarded with a $27 check.

"Keeps Us on Our Toes": When asked what they think of the suggestion system, managers and workers speak the same language. Says shop workman Carlson: "There is no question but this system keeps us on our toes and brings to light a lot of improvements which never would be turned up otherwise. You know, a man on the job every day is bound to see a lot of things that no one else would notice no matter how carefully he searched."

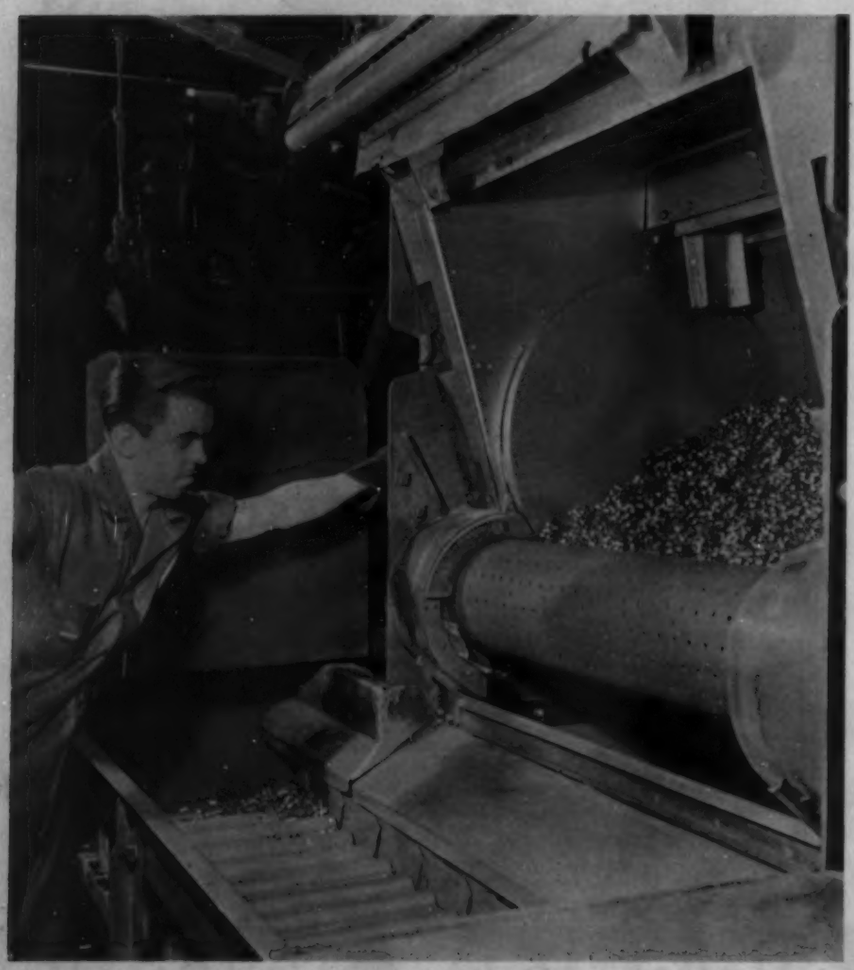
As manager of employe relations at Westinghouse, T. H. Owens adds this endorsement to Mr. Carlson's testimony: "Both the company and the employes benefit from a suggestion system, and I think the statistics prove that the suggestions rate as high in quality as they do in quantity. From 1910 through 1941 we received 101,962 suggestions, of which 33,089 were put into practice. That is a 32.5 per cent average, and that average is rising steadily.

"During the 32 years the plan has been in operation, we have paid an average of $7 for each suggestion, and the estimated saving brought about by all suggestions has been $1,251,530.73.

Suggestions Up 17 Per Cent: "Last year the number of suggestions increased 17 per cent over 1940; the number adopted was 21 per cent higher; cash awards were 36 per cent higher. These suggestors received $46,415, an average of $8 per suggestion.

Among the suggestions adopted since 1910, the greatest number concerned ways to improve our physical equipment, products and records. Better shop methods ranked second and ideas for safety devices, welfare and educational plans finished a close third."

CLEANS CARTRIDGE BELT LINKS RAPIDLY



IN CLEANING links for .30 and .50 caliber machine-gun bullets, this 27 x 36-inch Wheelabrator Tumblast airless abrasive blast cleaning machine built by American Foundry Equipment Co., Mishawaka, Ind., does four things: It removes all scale encrustations, roughens surfaces of links for finishing, maintains a high production schedule and prevents breakage or damaging during cleaning

Effective Date of Enameled Utensile Standard Shifted

Effective date for new production of multiple-coated, porcelain-enameled steel utensils, commercial standard CS100-42, has been extended to March 30, 1943, according to the National Bureau of Standards, Washington.

This action was taken inasmuch as steel so far available has not been found to be sufficiently suitable for the production of enameled utensils to guarantee compliance with the standard without a serious waste of material and increased cost of production.

Also the situation with reference to certain chemicals necessary for enameling has changed several times, and the future supply is uncertain. In addition, the labor situation is making it increasingly difficult to maintain trained forces necessary to produce enameled utensils according to the standard.

NEMA Issues Switchgear Assemblies Standards

National Electrical Manufacturers Association, 155 East Forty-fourth street, New York, reports that its recent issue of "Power Switchgear Assemblies Standards", publication No. 42-72, is a revision of the 1937 edition.

The new standards cover assemblies of switchgear devices such as switches, interrupting devices, control, metering, protective and regulating equipment with associated interconnections and supporting structures.

General manufacturing and application standards applying to switchgear devices are contained in one section of the book. Standards for indoor metal-clad switchgear, removable truck switchgear, indoor cubicle switchgear, outdoor switch houses, enclosed low-voltage air circuit breaker switchgear (up to 600 volts alternating current and up to 750 volts direct current) and automatic switchgear are specifically covered.

Included also are definitions, graphical symbols and information pertaining to standard equipment.

WPB Manifests Concern Over Scrap Supply for Winter

Sets 7,000,000 tons as necessary stockpile at year end. . . Plate situation eases but sheet and bar deliveries are tight. . . Iron ore stocks well above last year's

DEMAND
No abatement in war needs

PRODUCTION
Continues at 98 per cent

PRICES
Unchanged at ceilings

INCREASING concern is being manifested by the War Production Board over prospects for next winter's scrap supply. Conservation division has set 7,000,000 tons as necessary reserve inventory at the end of the year to assure uninterrupted steel production at capacity through the cold months.

To attain this objective the salvage campaign is being intensified and scrap is being dragged out from many hidden sources. At present the flow is little more than sufficient to maintain steel output at the current high rate, tonnage being laid down for winter use being insignificant. An encouraging feature is the rise in monthly receipts by consumer plants, increasing from 1,869,000 tons in January to 2,400,000 tons in July, although requirements for steelmaking have been consuming this increased volume from month to month.

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While heavy pressure continues for sheared plates October allocations point to easing demand for strip plate and some mills will be able to devote more tonnage to sheets than for some time. This shift indicates that pressing requirements are being met and stocks built up to a safe working margin. Some mills have been given no plate tonnage below the AA groups, with others allocated material as low as A-8-a, though the lower ratings cover little tonnage.

Delivery promises on sheets are becoming further deferred and many producers refuse to make firm promises. Buying is light, except for government requirements, and the tight situation is due in part to reduced allocations of semifinished steel. In some cases sheet mills are operating considerably below capacity for this reason. Considerable sheet tonnage is on order for use in fabricating landing field mesh. Tonnage on mill books is almost exclusively in top ratings and some producers have more difficulty in meeting sheet deliveries than in plates. Government requirements, formerly almost exclusively in heavier gages, now have broadened to include nearly all specifications, even to cold-rolled electrical sheets.

Little change is noted in the pig iron situation, October allocations being expected to parallel recent months, with slight changes as more melters engage in direct war work. Sufficient iron is being supplied for all essential needs and melters in nearly all cases are pleased with distribution. Output is being increased steadily and time lost for relining is being cut materially. Carnegie-Illinois Steel Co. has relighted its Clairton No. 1 stack after relining in 48 days. In most districts all stacks are in production, few being down for repair. Granite City Pig Iron Co. is meeting delays in rehabilitating its second stack, material deliveries being slow.

Bolt and nut demand is heavy and manufacturers meet difficulty in view of limited supply of steel bars. On top ratings many can not offer deliveries before next year. An inquiry is out for 500 tons of heavy construction bolts, all of one size. An inquiry for 800 tons of wrought iron bolts and 200 tons of wrought iron spikes has been placed.

Steelmaking operations last week held at 98 per cent of capacity for the fifth week. Only slight changes were made in active equipment. Pittsburgh advanced 1 point to 96 per cent, Cleveland ½-point to 93½, Cincinnati 9 points to 92 and Detroit 6 points to 95. Wheeling dropped 4 points to 80½ per cent, St. Louis 3 points to 92 and eastern Pennsylvania ½-point to 96. Unchanged rates were as follows: Chicago, 102½; Buffalo, 90½; Youngstown, 95; New England, 100; Birmingham, 95.

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Program of the Association of American Railroads for 80,000 freight cars in 1943 appears larger than can be realized in view of lack of steel for that purpose and conversion of many carbuilding shops to war production. Requirements for lend-lease and the armed forces are expected to be heavy and will take precedence over domestic car needs.

August consumption of Lake Superior iron ore totaled 7,155,202 gross tons, slightly under the July figure of 7,175,845 tons. The all-time high was 7,239,788 tons, smelted in May. For the year to Sept. 1 consumption was 56,271,764 tons, compared with 49,712,949 tons in the same period last year. Active furnaces Sept. 1 numbered 189, compared with 190 Aug. 1. Ore stocks at blast furnaces and on Lake Erie docks Sept. 1 totaled 43,236,172 tons, compared with 36,468,769 tons a year earlier.

Steel and iron composite prices are steady, controlled by OPA ceilings, in which no changes have been made. Finished steel composite is $56.73, semifinished steel $36.00, steelmaking pig iron $23.05 and steelmaking scrap $19.17.

COMPOSITE MARKET AVERAGES

	Sept. 26	Sept. 19	Sept. 12	One Month Ago Aug., 1942	Three Months Ago June, 1942	One Year Ago Sept., 1941	Five Years Ago Sept., 1937
Finished Steel	$56.73	$56.73	$56.73	$56.73	$56.73	$56.73	$62.18
Semifinished Steel	36.00	36.00	36.00	36.00	36.00	36.00	40.00
Steelmaking Pig Iron	23.05	23.05	23.05	23.05	23.05	23.05	22.84
Steelmaking Scrap	19.17	19.17	19.17	19.17	19.17	19.17	19.05

Finished Steel Composite:—Average of industry-wide prices on sheets, strip, bars, plates, shapes, wire, nails, tin plate, standard and line pipe. **Semifinished Steel Composite:**—Average of industry-wide prices on billets, slabs, sheet bars, skelp and wire rods. **Steelmaking Pig Iron Composite:**—Average of basic pig iron prices at Bethlehem, Birmingham, Buffalo, Chicago, Cleveland, Neville Island, Granite City and Youngstown. **Steelworks Scrap Composite:**—Average of No. 1 heavy melting steel prices at Pittsburgh, Chicago and eastern Pennsylvania.

COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

Finished Material	Sept. 26, 1942,	Aug. 1942	June 1942	Sept. 1941
Steel bars, Pittsburgh	2.15c	2.15c	2.15c	2.15c
Steel bars, Chicago	2.15	2.15	2.15	2.15
Steel bars, Philadelphia	2.49	2.49	2.49	2.47
Shapes, Pittsburgh	2.10	2.10	2.10	2.10
Shapes, Philadelphia	2.22	2.22	2.22	2.22
Shapes, Chicago	2.10	2.10	2.10	2.10
Plates, Pittsburgh	2.10	2.10	2.10	2.10
Plates, Philadelphia	2.15	2.15	2.15	2.15
Plates, Chicago	2.10	2.10	2.10	2.10
Sheets, hot-rolled, Pittsburgh	2.10	2.10	2.10	2.10
Sheets, cold-rolled, Pittsburgh	3.05	3.05	3.05	3.05
Sheets, No. 24 galv., Pittsburgh	3.50	3.50	3.50	3.50
Sheets, hot-rolled, Gary	2.10	2.10	2.10	2.10
Sheets, cold-rolled, Gary	3.05	3.05	3.05	3.05
Sheets, No. 24 galv., Gary	3.50	3.50	3.50	3.50
Bright bess., basic wire, Pittsburgh	2.60	2.60	2.60	2.60
Tin plate, per base box, Pittsburgh	$5.00	$5.00	$5.00	$5.00
Wire nails, Pittsburgh	2.55	2.55	2.55	2.55

Semifinished Material				
Sheet bars, Pittsburgh, Chicago	$34.00	$34.00	$34.00	$34.00
Slabs, Pittsburgh, Chicago	34.00	34.00	34.00	34.00
Rerolling billets, Pittsburgh	34.00	34.00	34.00	34.00
Wire rods No. 5 to 9/32-inch, Pittsburgh	2.00	2.00	2.00	2.00

Pig Iron	Sept. 26, 1942,	Aug. 1942	June 1942	Sept. 1941
Bessemer, del. Pittsburgh	$25.19	$25.19	$25.19	$25.34
Basic, Valley	23.50	23.50	23.50	23.50
Basic, eastern, del. Philadelphia	25.39	25.39	25.39	25.34
No. 2 fdry., del. Pgh., N.&S. Sides	24.69	24.69	24.69	24.69
No. 2 foundry, Chicago	24.00	24.00	24.00	24.00
Southern No. 2, Birmingham	20.88	20.38	20.38	20.38
Southern No. 2, del. Cincinnati	24.30	24.30	24.30	24.06
No. 2X, del. Phila. (differ. av.)	26.265	26.265	26.265	26.215
Malleable, Valley	24.00	24.00	24.00	24.00
Malleable, Chicago	24.00	24.00	24.00	24.00
Lake Sup., charcoal, del. Chicago	31.54	31.54	31.54	31.34
Gray forge, del. Pittsburgh	24.19	24.19	24.19	24.19
Ferromanganese, del. Pittsburgh	140.65	140.65	140.65	125.33

Scrap				
Heavy melting steel, Pitts.	$20.00	$20.00	$20.00	$20.00
Heavy melt. steel, No. 2, E. Pa.	18.75	18.75	18.75	17.75
Heavy melting steel, Chicago	18.75	18.75	18.75	18.75
Rails for rolling, Chicago	22.25	22.25	22.25	22.25
No. 1 cast, Chicago	20.00	20.00	20.00	21.215

Coke				
Connellsville, furnace, ovens	$6.00	$6.00	$6.00	$6.25
Connellsville, foundry, ovens	7.25	7.25	7.25	7.25
Chicago, by-product fdry., del.	12.25	12.25	12.25	12.25

STEEL, IRON, RAW MATERIAL, FUEL AND METALS PRICES

Following are maximum prices established by OPA Schedule No. 6 issued April 16, 1941, revised June 20, 1941 and Feb. 4, 1942 The schedule covers all iron or steel ingots, all semifinished iron or steel products, all finished hot-rolled, cold-rolled iron or steel products and any iron or steel product which is further finished by galvanizing, plating, coating, drawing, extruding, etc., although only principal established basing points for selected products are named specifically. All seconds and off-grade products also are covered. Exceptions applying to individual companies are noted in the table.

Semifinished Steel

Gross ton basis except wire rods, skelp.

Carbon Steel Ingots: F.o.b. mill base, rerolling qual., stand. analysis, $31.00.
(Empire Sheet & Tin Plate Co., Mansfield, O., may quote carbon steel ingots at $33 gross ton, f.o.b. mill.)

Alloy Steel Ingots: Pittsburgh base, uncropped, $45.00.

Rerolling Billets, Slabs: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Sparrows Point, Birmingham, Youngstown, $34.00; Detroit, del. $36.25; Duluth (bil.) $36.00.
(Wheeling Steel Corp. allocated 21,000 tons 2" square, base grade rerolling billets under lease-lend during first quarter 1942 at $37, f.o.b. Portsmouth, O.; Andrews Steel Co. may quote carbon steel slabs $41 gross ton at established basing points.)

Forging Quality Billets: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham, Youngstown, $40.00; Detroit, del. $42.25; Duluth, $42.00.
(Andrews Steel Co. may quote carbon forging billets $50 gross ton at established basing points.)

Open Hearth Shell Steel: Pittsburgh, Chicago, base 1000 tons one size and section: 3-12 in., $52.00; 12-18 in., $54.00; 18 in. and over, $56.00.

Alloy Billets, Slabs, Blooms: Pittsburgh, Chicago, Buffalo, Bethlehem, Canton, Massillon, $54.00.

Sheet Bars: Pittsburgh, Chicago, Cleveland, Buffalo, Canton, Sparrows Point, Youngstown, $34.00.
(Empire Sheet & Tin Plate Co., Mansfield, O., may quote carbon steel sheet bars at $39 gross ton, f.o.b. mill.)

Skelp: Pittsburgh, Chicago, Sparrows Pt., Youngstown, Coatesville, lb., $1.90.

Wire Rods: Pittsburgh, Chicago, Cleveland, Birmingham, No. 5—9/32 in., inclusive, per 100 lbs., $2.00.

Do., over 9/32—47/64-in., incl., $2.15. Worcester add $0.10 Galveston, $0.27. Pacific Coast $0.50 on water shipment.

Bars

Hot-Rolled Carbon Bars: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham, base 20 tons one size, 2.15c; Duluth, base 2.25c; Detroit, del. 2.27c; New York del. 2.51c; Phila. del. 2.49c; Gulf Ports, dock 2.53c, all-rail 2.59c Pac. ports, dock 2.50c; all rail 3.25c.
(Phoenix Iron Co., Phoenixville, Pa., may quote 2.35c at established basing points.)
Joslyn Mfg. Co. may quote 2.35c, Chicago base. Calumet Steel Division, Borg Warner Corp., may quote 2.35c, Chicago base, on bars produced on its 8-inch mill.)

Rail Steel Bars: Same prices as for hot-rolled carbon bars except base is 5 tons.
(Sweet's Steel Co., Williamsport, Pa., may quote rail steel merchant bars 2.35c f.o.b. mill.

Hot-Rolled Alloy Bars: Pittsburgh, Chicago, Canton, Massillon, Buffalo, Bethlehem, base 20 tons one size, 2.70c Detroit, del. 2.82c.

S.A.E.	Alloy Diff.	S.A.E.	Alloy Diff.
2000	0.35	5100 Spr. flats	0.15
2100	0.75	5100 80-1.10 Cr	0.15
2300	1.70	6100 Bars	1.20
2500	2.55	6100 Spr. flats	0.85
3100	0.70	Carb., Van.	0.35
3200	1.35	9200 Spr. flats	0.15
3300	3.80	9200 Spr. rounds, squares	0.40
3400	3.20	T 1300, Mn, mean 1.51-2.00	0.10
4100 .15-25 Mo. 46.00 .20-.30 Mo. 1.50-2.00; Ni	0.55 1.20	Do., carbon under 0.20 max.	0.35

Cold-Finished Carbon Bars: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, base 20,000-39,999 lbs., 2.65c; Detroit 2.70.

Cold-Finished Alloy Bars: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, base 3.35c; Detroit, del. 3.47c.

Turned, Ground Shafting: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, base (not including turning, grinding, polishing extras) 2.65c; Detroit 2.72c.

Reinforcing Bars (New Billet): Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Sparrows Point, Buffalo, Youngstown, base 2.15c; Detroit del. 2.27c; Gulf ports, dock 2.52c, all-rail 2.61c; Pacific ports, dock 2.80c, all-rail 3.27c.

Reinforcing Bars (Rail Steel): Pittsburgh, Chicago, Gary, Cleveland, Birmingham, base 2.15c; Detroit, del. 2.27c; Gulf ports, dock 2.52c, all-rail 2.61c; Pacific ports, dock 2.80c, all-rail 3.25c.
(Sweet's Steel Co., Williamsport, Pa., may quote rail steel reinforcing bars 2.35c, f.o.b. mill.

Iron Bars: Single refined, Pitts. 4.40c, double refined 5.40c; Pittsburgh, staybolt, 5.75c; Terre Haute, common, 2.15c.

Sheets, Strip

Hot-Rolled Sheets: Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Buffalo, Youngstown, Sparrows Pt., Middletown, base 2.10c; Granite City, base 2.20c; Detroit del. 2.22c; Phila. del. 2.28c; New York del., 2.35c Pacific ports 2.65c.
(Andrews Steel Co. may quote hot-rolled sheets for shipment to Detroit and the Detroit area on the Middletown, O. base.)

Cold-Rolled Sheets: Pittsburgh, Chicago, Cleveland, Gary, Buffalo, Youngstown, Middletown, base, 3.05c; Granite City, base 3.15c; Detroit del. 3.17c; New York del. 3.41c; Phila. del. 3.39c; Pacific ports, 3.70c.

Galvanized Sheets, No. 24: Pittsburgh, Chicago, Gary, Birmingham, Buffalo, Youngstown, Sparrows Point, Middletown, base 3.50c; Granite City, base 3.60c; New York del. 3.74c Phila. del. 3.68c; Pacific ports 4.05c.
(Andrews Steel Co. may quote galvanized sheets 3.75c at established basing points.)

Corrugated Galv. Sheets: Pittsburgh, Chicago, Gary, Birmingham, 29 gage, per square 3.31c.

Culvert Sheets: Pittsburgh, Chicago, Gary, Birmingham, 16 gage, not corrugated, copper alloy 3.60c; copper iron 3.90c, pure iron 3.95c; zinc-coated, hot-dipped, heat-treated, No. 24, Pittsburgh 4.25c.

Enameling Sheets: Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Middletown, 10 gage.

base 2.75c; Granite City, base 2.85c; Pacific ports 3.40c.
Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Middletown, 20 gage, base 3.35c; Granite City, base 3.45c; Pacific ports 4.00c.

Electrical Sheets, No. 24:

	Pittsburgh Base	Pacific Ports	Granite City
Field grade	3.20c	3.95c	3.30c
Armature	3.55c	4.30c	3.65c
Electrical	4.05c	4.80c	4.15c
Motor	4.95c	5.70c	5.05c
Dynamo	5.65c	6.40c	5.75c
Transformer			
72	6.15c	6.90c	.....
65	7.15c	7.90c	.....
58	7.65c	8.40c	.....
52	8.45c	9.20c	.....

Hot-Rolled Strip: Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Middletown, base, 1 ton and over, 12 inches wide and less 2.10c; Detroit del. 2.22c; Pacific ports 2.75c. (Josiyn Mfg. Co. may quote 2.30c, Chicago base.)
Cold Rolled Strip: Pittsburgh, Cleveland, Youngstown, 0.25 carbon and less 2.80c; Chicago, base 2.90c; Detroit, del. 2.92c; Worcester base 3.00c.
Commodity C. R. Strip: Pittsburgh, Cleveland, Youngstown, base 3 tons and over, 2.95c; Worcester base 3.35c.
Cold-Finished Spring Steel: Pittsburgh, Cleveland bases, add 20c for Worcester; .26-.50 Carb., 2.80c; .51-.75 Carb., 4.30c; .76-1.00 Carb.. 6.15c; over 1.00 Carb., 8.35c.

Tin, Terne Plate

Tin Plate: Pittsburgh, Chicago, Gary, 100-lb. base box, $5.00; Granite City $5.10.
Tin Mill Black Plate: Pittsburgh, Chicago, Gary, base 29 gage and lighter, 3.05c; Granite City, 3.15c; Pacific ports, boxed 4.05c.
Long Ternes: Pittsburgh, Chicago, Gary, No. 24 unassorted 3.80c.
Manufacturing Ternes: (Special Coated) Pittsburgh, Chicago, Gary, 100-base box $4.30; Granite City $4.40.
Roofing Ternes: Pittsburgh base per package 112 sheets, 20 x 28 in., coating I.C., 8-lb. $12.00; 15-lb. $14.00; 20-lb. $15.00; 25-lb. $16.00; 30-lb. $17.25; 40-lb. $19.50.

Plates

Carbon Steel Plates: Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Sparrows Point, Coatesville, Claymont, 2.10c; New York, del., 2.30-2.55c; Phila., del., 2.15c; St. Louis, 2.34c; Boston, del., 2.42-67c; Pacific ports, 2.65c; Gulf Ports, 2.47c.
(Granite City Steel Co. may quote carbon plates 2.35c, f.o.b. mill. Central Iron & Steel Co. may quote plates at 2.20c, f.o.b. basing points.)
Floor Plates: Pittsburgh, Chicago, 3.35c; Gulf ports, 3.72c; Pacific ports, 4.00c.
Open-Hearth Alloy Plates: Pittsburgh, Chicago, Coatesville, 3.50c.
Wrought Iron Plates: Pittsburgh, 3.80c.

Shapes

Structural shapes: Pittsburgh, Chicago, Gary, Birmingham, Buffalo, Bethlehem, 2.10c; New York, del., 2.28c; Phila., del., 2.22c; Gulf ports, 2.47c; Pacific ports, 2.75c.
(Phoenix Iron Co., Phoenixville, Pa. may quote carbon steel shapes at 2.30c at established basing points and 2.50c, Phoenixville, for export.)
Steel Sheet Piling: Pittsburgh, Chicago, Buffalo, 2.40c.

Wire Products, Nails

Wire: Pittsburgh, Chicago, Cleveland, Birmingham (except spring wire) to manufacturers in carloads (add $2 for Worcester):

Bright basic, bessemer wire	2.60c
Galvanized wire	2.60c
Spring wire	3.20c
Wire Products to the Trade:	
Standard and cement-coated wire nails, polished and staples, 100-lb. keg	$2.55
Annealed fence wire, 100 lb.	3.05
Galvanized fence wire, 100 lb.	3.40
Woven fence, 12½ gage and lighter, per base column	67
Do., 11 gage and heavier	70
Barbed wire, 80-rod spool, col.	70
Twisted barbless wire, col.	70
Single loop bale ties, col.	59
Fence posts, carloads, col.	69
Cut nails, Pittsburgh, carloads	$3.85

Pipe, Tubes

Welded Pipe: Base price in carloads to consumers about $200 per net ton. Base discounts on steel pipe Pittsburgh and Lorain, O.; Gary, Ind. 2 points less on lap weld, 1 point less on butt weld. Pittsburgh base only on wrought iron pipe.

Butt Weld

	Steel Blk.	Steel Galv.		Iron Blk.	Iron Galv.
⅛	56	33	⅛	24	3½
¼ & ⅜	59	40½	¼	30	10
½	63½	51	1-1¼	34	16
¾	66½	58	1½	38	18½
1-3	68½	57½	2	37½	18

Lap Weld

	Steel Blk.	Steel Galv.		Iron Blk.	Iron Galv.
2	61	49¼	1¼	23	3½
2½-3½	64	52½	1½	28½	10
3½-6	66	54½	2	30½	12
7-8	65	52½	2½, 3½	31½	14½
9-10	64½	52	4	33½	18
11-12	63½	51	4½-8	32½	17
			9-12	28½	12

Boiler Tubes: Net base prices per 100 feet, f.o.b. Pittsburgh in carload lots, minimum wall, cut lengths 4 to 24 feet, inclusive.

O. D. Sizes	B.W.G.	—Seamless— Hot Rolled	Cold Drawn	—Lap Weld— Steel	Charcoal Iron
1"	13	$ 7.82	$ 9.01	.....	.....
1¼"	13	9.26	10.67	.....	.....
1½"	13	10.23	11.72	$ 9.72	$23.71
1¾"	13	11.64	13.42	11.06	22.93
2"	13	13.04	15.08	12.36	19.35
2¼"	13	14.54	16.76	13.79	21.63
2½"	12	16.01	18.45	15.16	.....
2¾"	12	17.54	20.21	16.58	26.57
2¾"	12	18.59	21.42	17.54	29.00
3"	12	19.50	22.48	18.35	31.38
3½"	11	24.63	28.37	23.15	39.81
4"	10	30.54	35.20	28.66	49.90
4½"	10	37.35	43.04	35.22	.....
5"	9	46.87	54.01	44.25	73.93
6"	7	71.96	82.93	68.14	.....

Rails, Supplies

Standard rails, over 60-lb., f.o.b. mill, gross ton, $40.00.
Light rails (billet), Pittsburgh, Chicago, Birmingham, gross ton, $40.00.
*Relaying rails, 35 lbs. and over, f.o.b. railroad and basing points, $28-$30.
Supplies: Angle bars, 2.70c; tie plates, 2.15c; track spikes, 3.00c; track bolts, 4.75c; do. heat treated, 5.00c.

*Fixed by OPA Schedule No. 46, Dec. 15, 1941.

Tool Steels

Tool Steels: Pittsburgh, Bethlehem, Syracuse, base, cents per lb.: Reg. carbon 14.00c; extra carbon 18.00c; special carbon 22.00c; oil-hardening 24.00c; high car.-chr. 43.00c.
High Speed Tool Steels:

Tung.	Chr.	Van.	Moly.	Pitts. base, per lb.
18.00	4	1	..	67.00c
18.00	4	2	1	77.00c
18.00	4	3	1	87.00c
1.5	4	1	8.5	54.00c
.....	4	2	8	54.00c
5.50	4	1.50	4	57.50c
5.50	4.50	4	4.50	70.00c

Stainless Steels

Base, Cents per lb.—f.o.b. Pittsburgh

Type	Bars	Plates	Sheets	H. R. Strip	C. R. Strip
CHROMIUM NICKEL STEEL					
302	24.00c	27.00c	34.00c	21.50c	28.00c
303	26.00	29.00	36.00	27.00	33.00
304	25.00	29.00	36.00	23.50	30.00
308	29.00	34.00	41.00	28.50	35.00
309	36.00	40.00	47.00	37.00	47.00
310	49.00	52.00	53.00	46.75	56.00
311	49.00	52.00	53.00	46.75	56.00
312	36.00	40.00	49.00	.....	.....
*316	40.00	44.00	48.00	40.00	48.00
*317	50.00	54.00	58.00	50.00	58.00
†321	29.00	34.00	41.00	29.25	38.00
‡347	33.00	38.00	45.00	33.00	42.00
431	19.00	22.00	29.00	17.50	22.50
STRAIGHT CHROMIUM STEEL					
403	21.50	24.50	29.50	21.25	27.00
**410	18.50	21.50	26.50	17.00	22.00
416	19.00	22.00	27.00	18.25	23.50
††420	24.00	28.50	33.50	23.75	36.50
430	19.00	22.00	29.00	17.50	22.50
‡‡430F.	19.50	22.50	29.50	18.75	24.50
442	22.50	25.50	32.50	24.00	32.00
446	27.50	30.50	36.50	35.00	52.00
501	8.00	12.00	15.75	12.00	17.00
502	9.00	13.00	16.75	13.00	18.00
STAINLESS CLAD STEEL (20%)					
304	.....	‡‡18.00	19.00	.....	.....

*With 2-3% moly. †With titanium. ‡With columbium. **Plus machining agent. ††High carbon. ‡‡Free machining. ‡‡Includes annealing and pickling.

Basing Point Prices are (1) those announced by U. S. Steel Corp. subsidiaries for first quarter of 1941 or in effect April 16, 1941 at designated basing points or (2) those prices announced or customarily quoted by other producers at the same designated points. Base prices under (2) cannot exceed those under (1) except to the extent prevailing in third quarter of 1940.
Extras mean additions or deductions from base prices in effect April 16, 1941.
Delivered prices applying to Detroit, Eastern Michigan, Gulf and Pacific Coast points are deemed basing points except in the case of the latter two areas when water transportation is not available, in which case nearest basing point price, plus all-rail freight may be charged.
Domestic Ceiling prices are the aggregate of (1) governing basing point price, (2) extras and (3) transportation charges to the point of delivery as customarily computed. **Governing basing point** is basing point nearest the consumer providing the lowest delivered price.
Emergency basing point is the basing point at or near the place of production or origin of shipment.
Seconds or off-grade iron or steel products cannot be sold at delivered prices exceeding those applying to material of prime quality.
Export ceiling prices may be either the aggregate of (1) governing basing point or emergency basing point (2) export extras (3) export transportation charges provided they are the f.a.s. seaboard quotations of the U. S. Steel Export Co. on April 16, 1941. Domestic or export extras may be used in case of Lease-Lend tonnage.

Bolts, Nuts

F.o.b. Pittsburgh, Cleveland, Birmingham, Chicago. Discounts for carloads additional 5%, full containers, add 10%.

Carriage and Machine

⅛ x 6 and smaller	63½ off
Do., ¼ and ⅜ x 6-in. and shorter	63½ off
Do., ½ to 1 x 6-in. and shorter	61 off
1⅛ and larger, all lengths	59 off
All diameters, over 6-in. long	50 off
Tire bolts	50 off
Step bolts	56 off
Plow bolts	65 off

Stove Bolts

In packages with nuts separate 71-10 off; with nuts attached 71 off; bulk 80 off on 15,000 of 3-inch and shorter, or 5000 over 3-in.

Nuts

Semifinished hex.	U.S.S.	S.A.E.
⅜-inch and less	62	64
½-1-inch	59	60
1⅛-1½-inch	57	58
1⅝ and larger	56	..

Hexagon Cap Screws

Upset 1-in., smaller	64 off
Milled 1-in., smaller	60 off

Square Head Set Screws

Upset, 1-in., smaller	71 off
Headless, ¼-in., larger	60 off
No. 10, smaller	70 off

Piling

Pittsburgh, Chicago, Buffalo 2.40c

Rivets, Washers

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham

Structural	3.75c
½-inch and under	65-5 off
Wrought washers, Pittsburgh, Chicago, Philadelphia, to jobbers and large nut, bolt manufacturers l.c.l.	$2.75-3.00 off

Metallurgical Coke

Price Per Net Ton

Beehive Ovens

Connellsville, furnace	*$6.00
Connellsville, foundry	7.00- 7.50
Connellsville prem. fdry.	7.25- 7.60
New River, foundry	8.00- 8.25
Wise county, foundry	7.50
Wise county, furnace	6.50
By-Product Foundry	
Kearny, N. J., ovens	12.15
Chicago, outside delivered	11.50
Chicago, delivered	12.25
Terre Haute, delivered	12.00
Milwaukee, ovens	12.25
New England, delivered	13.75
St. Louis, delivered	†12.25
Birmingham, ovens	8.80
Indianapolis, delivered	12.00
Cincinnati, delivered	11.75
Cleveland, delivered	12.30
Buffalo, delivered	12.80
Detroit, delivered	12.25
Philadelphia, delivered	12.36

Operators of hand-drawn ovens using trucked coal may charge $6.50, effective Aug. 12, 1942.
† $12.75 from other than Ala., Mo., Tenn.

Coke By-Products

Spot, gal., freight allowed east of Omaha

Pure and 90% benzol	15.00c
Toluol, two degree	28.00c
Solvent naphtha	27.00c
Industrial xylol	27.00c
Per lb. f.o.b. works	
Phenol (car lots, returnable drums)	12.50c
Do. less than car lots	13.25c
Do. tank cars	11.50c
Eastern Plants, per lb.	
Naphthalene flakes, balls, bbls. to jobbers	8.00c
Per ton, bulk, f.o.b. port	
Sulphate of ammonia	$28.20

Pig Iron

Prices (in gross tons) are maximums fixed by OPA Price Schedule No. 10, effective June 10, 1941. Exceptions indicated in footnotes. Allocation regulations from WPB Order M-17, expiring Dec. 31, 1942. Base prices bold face, delivered light face.

	No. 2 Foundry	Basic	Bessemer	Malleable
Bethlehem, Pa., base	$25.00	$24.50	$26.00	$25.50
Newark, N. J., del.	26.62	26.12	27.62	27.12
Brooklyn, N. Y., del.	27.65	....	....	28.15
Birdsboro, Pa., del.	25.00	24.50	26.00	25.50
Birmingham, base	†20.38	†19.00	....	....
Baltimore, del.	25.67	....	....	....
Boston, del.	25.12	....	....	....
Chicago, del.	‡24.47	....	....	....
Cincinnati, del.	24.30	22.92	....	....
Cleveland, del.	24.12	23.24	....	....
Newark, N. J., del.	26.24	....	....	....
Philadelphia, del.	25.51	25.01	....	....
St. Louis, del.	‡24.12	23.24	....	....
Buffalo, base	24.00	23.00	25.00	24.50
Boston, del.	25.50	25.00	26.50	26.00
Rochester, del.	25.53	....	26.53	26.03
Syracuse, del.	26.08	....	27.08	26.58
Chicago, base	24.00	23.50	24.50	24.00
Milwaukee, del.	25.17	24.67	25.67	25.17
Muskegon, Mich., del.	27.38	....	....	27.38
Cleveland, base	24.00	23.50	24.50	24.00
Akron, Canton, O., del.	25.47	24.97	25.97	25.47
Detroit, base	24.00	23.50	24.50	24.00
Saginaw, Mich., del.	26.45	25.95	26.95	26.45
Duluth, base	24.50	....	25.00	24.50
St. Paul, del.	26.76	....	27.26	26.76
Erie, Pa., base	24.00	23.50	25.00	24.50
Everett, Mass., base	25.00	24.50	26.00	25.50
Boston	25.50	25.00	26.50	26.00
Granite City, Ill., base	24.00	23.50	24.50	24.00
St. Louis, del.	24.50	24.00	....	24.50
Hamilton, O., base	24.00	23.50	....	24.00
Cincinnati, del.	24.68	24.68	....	25.35
Neville Island, Pa., base	24.00	23.50	24.50	24.00
‖Pittsburgh, del., No. 2 & So. sides	24.69	24.19	25.19	24.69
Provo, Utah, base	22.00	....	....	....
Sharpsville, Pa., base	24.00	23.50	24.50	24.00
Sparrows Point, Md., base	25.00	24.50	....	....
Baltimore, del.	26.05	....	....	....
Steelton, Pa., base	....	24.50	....	25.50
Swedeland, Pa., base	25.00	24.50	26.00	25.50
Philadelphia, del.	25.89	25.39	....	26.39
Toledo, O., base	24.00	23.50	24.50	24.00
Mansfield, O., del.	26.06	25.56	26.56	26.06
Youngstown, O., base	24.00	23.50	24.50	24.00

*Basic silicon grade (1.75-2.25%), add 50c for each 0.25%. †For phosphorus 0.70 and over deduct 38c. ‡Over 0.70 phos. ‖For McKees Rocks, Pa., add .55 to Neville Island base; Lawrenceville, Homestead, McKeesport, Ambridge, Monaca, Aliquippa, .84; Monessen, Monongahela City .97 (water); Oakmont, Verona 1.11; Brackenridge 1.24.

High Silicon, Silvery

6.00-6.50 per cent (base)	$29.50
6.51-7.00	$30.50
7.01-7.50	31.50
7.51-8.00	32.50
8.01-8.50	33.50
8.51-9.00	34.50
9.01- 9.50	$35.50
9.51-10.00	36.50
10.01-10.50	37.50
10.51-11.00	38.50
11.01-11.50	39.50

F.o.b. Jackson county, O., per gross ton. Buffalo base prices are $1.25 higher. Prices subject to additional charge of 50 cents a ton for each 0.50% manganese in excess of 1.00%.

Bessemer Ferrosilicon

Prices same as for high silicon silvery iron, plus $1 per gross ton. (For higher silicon irons a differential over and above the price of base grades is charged as well as for the hard chilling irons, Nos. 5 and 6.)

Charcoal Pig Iron

Northern

Lake Superior Furn.	$28.00
Chicago, del.	31.54

Southern

Semi-cold blast, high phos, f.o.b. furnace, Lyles, Tenn.	$28.50
Semi-cold blast, low phos., f.o.b. furnace, Lyles, Tenn.	33.00

Gray Forge

Neville Island, Pa.	$23.50
Valley, base	23.50

Low Phosphorus

Basing points: Birdsboro and Steelton, Pa., and Buffalo, N. Y., $29.50 base; $30.81, delivered, Philadelphia.

Switching Charges: Basing point prices are subject to an additional charge for delivery within the switching limits of the respective districts.

Silicon Differentials: Basing point prices are subject to an additional charge not to exceed 50 cents a ton for each 0.25 silicon in excess of base grade (1.75 to 2.25%).

Phosphorous Differential: Basing point prices are subject to a reduction of 38 cents a ton for phosphorous content of 0.70% and over.

Manganese Differentials: Basing point prices subject to an additional charge not to exceed 50 cents a ton for each 0.50% manganese content in excess of 1.0%.

Ceiling prices are the aggregate of (1) governing basing point (2) differentials (3) transportation charges from governing basing point to point of delivery as customarily computed. Governing basing point is the one resulting in the lowest delivered price for the consumer.

Exceptions to Ceiling Prices: Pittsburgh Coke & Iron Co. (Sharpsville, Pa. furnace only) and Struthers Iron & Steel Co. may charge 50 cents a ton in excess of basing point prices for No. 2 Foundry, Basic, Bessemer and Malleable. Mystic Iron Works, Everett, Mass., may exceed basing point prices by $1 per ton, effective April 20, 1942. Chester, Pa., furnace of Pittsburgh Coke & Iron Co. may exceed basing point prices by $2.25 per ton, effective July 27, 1942.

Refractories

Per 1000 f.o.b. Works, Net Prices

Fire Clay Brick	
Super Quality	
Pa., Mo., Ky.	$64.60
First Quality	
Pa., Ill., Md., Mo., Ky.	51.30
Alabama, Georgia	51.30
New Jersey	56.00
Ohio	43.00
Second Quality	
Pa., Ill., Md., Mo., Ky.	46.55
Alabama, Georgia	38.00
New Jersey	49.00
Ohio	36.00
Malleable Bung Brick	
All bases	$59.85
Silica Brick	
Pennsylvania	$51.30
Joliet, E. Chicago	58.90
Birmingham, Ala.	51.30
Ladle Brick	
(Pa., O., W. Va., Mo.)	
Dry press	$31.00
Wire cut	29.00
Magnesite	
Domestic dead-burned grains, net ton f.o.b. Chewelah, Wash., net ton, bulk	22.00
net ton, bags	26.00
Basic Brick	
Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.	
Chrome brick	$54.00
Chem. bonded chrome	54.00
Magnesite brick	76.00
Chem. bonded magnesite	65.00

Fluorspar

Washed gravel, f.o.b. Ill., Ky., net ton, carloads, all rail	$23.00-25.00
Do., barge	23.00-25.00
No. 2 lump	23.00-25.00

(OPA May 11 established maximum at Jan. 2, 1942, level.)

Ferroalloy Prices

Ferromanganese: 78-82%, carlots, gross ton, duty paid, Atlantic ports, $135; Del. Pittsburgh $140.65; f.o.b. Southern furnaces $135; Add $6 per gross ton for packed carloads $10 for ton, $13.50 for less-ton and $18 for less than 200-lb. lots, packed.

Spiegeleisen: 19-21%, carlots per gross ton, Palmerton, Pa. $36.

Electrolytic manganese: 99.9% plus, less ton lots, per lb. 42.00c. Ton lots 40.00c. Annual contracts 38.00c.

Chromium Metal: Per lb. contained chromium in gross ton lots, contract basis, freight allowed, 98% 80.00c, 98% 79.00c. Spot prices 5 cents per lb. higher.

Ferrocolumbium: 50-60%, per lb. contained columbium in gross ton lots, contract basis, f.o.b. Niagara Falls, N. Y. $2.25; less-ton lots $2.30. Spot prices 10 cents per lb. higher.

Ferrochrome: 66-70%; per lb. contained chromium in carloads, freight allowed, 4-6% carbon 13.00c; ton lots 13.75c; less-ton lots 14.00c; less than 200-lb. lots 14.25c. 66-72%, low carbon grades:

	Car loads	Ton lots	Less ton	Less 200 lbs.
2% C.	19.50c	20.25c	20.75c	21.00c
1% C.	20.50c	21.25c	21.75c	22.00c
0.20% C.	21.50c	22.25c	22.75c	23.00c
0.10% C.	22.50c	23.25c	23.75c	24.00c

Spot is ¼c higher

Chromium briquets: Contract basis in carloads per lb., freight allowed 8.25c; packed 9.50c; gross ton lots 8.75c; less-ton lots 9.00c; less 200-lb. lots 9.25c. Spot prices ¼-cent higher.

Ferromolybdenum: 55-75%, per lb. contained molybdenum, f.o.b. Langeloth and Washington, Pa., furnace, any quantity 95.00c.

Calcium Molybdate (Molyte): 40-45%, per lb. contained molybdenum, contract basis, f.o.b. Langeloth and Washington, Pa., any quantity, 80.00c.

Molybdic Oxide Briquets: 48-52%, per lb. contained molybdenum, f.o.b. Langeloth, Pa., any quantity 80.00c.

Molybdenum Oxide: 53-63%, per lb. contained molybdenum in 5 and 20 lb. molybdenum contained cans, f.o.b. Langeloth and Washington, Pa., any quantity 80.00c.

Molybdenum Powder: 99% per lb. in 200-lb. kegs, f.o.b. York, Pa. $2.60; 100-200 lb. lots $2.75; under 100-lb. lots $3.00.

Ferrophosphorus: 17-19%, based on 18% phosphorus content, with unitage of $3 for each 1% of phosphorus above or below the base; gross tons per carload f.o.b. sellers' works, with freight equalized with Rockdale, Tenn.; contract price $58.50, spot $62.25.

Ferrophosphorus: 23-26%, based on 24% phosphorus content, with unitage of $3 for each 1% of phosphorus above or below the base; gross tons per carload f.o.b. sellers' works, with freight equalized with Mt. Pleasant, Tenn.; contract price $75, spot $80.

Ferrosilicon: Contract basis in gross tons per carload, bulk, freight allowed; unitage applies to each 1% silicon above or below base.

	Carloads	Ton lots
50%	$ 74.50	$ 87.00
Unitage	1.50	1.75
75%	135.00	151.00
Unitage	1.80	2.00
85%	170.00	188.00
Unitage	2.00	2.20
90-95%	10.25c	11.25c

Spot prices ¼-cent higher.

Silicon Metal: Contract basis per lb., f.o.b. producers' plants, freight allowed; 1% iron; carlots 14.50c, ton lots 15.00c, less-ton lots 15.25c, less 200 lbs. 15.50c.

Silicon Metal: Contract basis per lb.; 2% iron; carlots 13.00c, ton lots 13.50c, less-ton lots 13.75c, less 200 lbs. 14.00c. Spot prices ¼-cent higher.

Silicon Briquets: Contract basis; in carloads, bulk freight allowed, per ton $74.50; packed $80.50; ton lots $84.50; less-ton lots per lb. 4.00c; less 200-lb. lots per lb. 4.25c. Spot ¼-cent per lb. higher on less-ton lots; $5 per ton higher on ton lots and over.

Silicomanganese: Contract basis freight allowed, 1½% carbon; in carloads per gross ton $128; ton lots $140.50. Spot $5 per ton higher.

Silico-manganese Briquets: Contract basis in carloads per pound, bulk freight allowed 5.50c; packed 5.75c; ton lots 6.00c; less-ton lots 6.25c; less 200-lb. lots 6.50c. Spot prices ¼-cent higher.

Ferrotungsten: Carlots, per lb. contained tungsten, $1.90.

Tungsten Metal Powder: 98-99%, per lb. any quantity $2.55-2.65.

Ferrotitanium: 40-45%, f.o.b. Niagara Falls, N. Y., per lb. contained titanium: ton lots $1.23; less-ton lots $1.25. Spot 5 cents per lb higher.

Ferrotitanium: 20-25%, 0.10 maximum carbon; per lb. contained titanium; ton lots $1.35; less-ton lots $1.40. Spot 5 cents per lb. higher.

High-Carbon Ferrotitanium: 15-20%, Contract basis, per gross ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi River and North of Baltimore and St. Louis, 6-8% carbon $142.50; 3-5% carbon $157.50.

Ferrovanadium: 35-40%, contract basis, per lb. contained vanadium, f.o.b. producer's plant with usual freight allowances; open-hearth grade $2.70; special grade $2.80; highly-special grade $2.90.

Vanadium Pentoxide: Technical grade, 88-92 per cent V_2O_5; contracts, any quantity, $1.10 per pound V_2O_5 contained; spot 5 cents per pound higher.

Zirconium Alloys: 12-15%, contract basis, carloads bulk, per gross ton $102.50; packed $107.50; ton lots $108; less-ton lots $112.50. Spot $5 per ton higher.

Zirconium alloy: 35-40%, contract basis, carloads in bulk or package, per lb. of alloy 14.00c; gross ton lots 15.00c; less-ton lots 16.00c. Spot ¼-cent higher.

Alsifer: (Approx. 20% aluminum, 40% silicon, 40% iron) Contract basis, f.o.b. Niagara Falls, N. Y., per lb. 7.50c; ton lots 8.00c. Spot ¼-cent higher.

Simanal: (Approx. 20% each silicon, manganese, aluminum) Contract basis, freight allowed, per lb. of alloy; carlots 10.50c; ton lots 11.00c, less ton lots, 11.50c.

WAREHOUSE STEEL PRICES

Base Prices in Cents Per Pound, Delivered Locally, Subject to Prevailing Differentials. As of April 16, 1942

	Soft Bars	Hot-rolled Strip Bands	Hot-rolled Strip Hoops	Plates ¼-in. & Over	Structural Shapes	Floor Plates	Sheets Hot Rolled	Sheets Cold Rolled	Sheets Galv. No. 24	Cold Rolled Strip	Cold Drawn Bars Carbon	Cold Drawn Bars S.A.E. 2300	Cold Drawn Bars S.A.E. 3100
Boston	3.98	4.06	5.06	3.85	3.85	5.66	3.71	4.68	5.11	3.46	4.13	8.88	7.23
New York (Met.)	3.84	3.96	3.96	3.76	3.75	5.56	3.58	4.60	5.00	3.51	4.09	8.84	7.19
Philadelphia	3.83	3.95	4.45	3.55	3.55	5.25	3.55	4.05	4.65	3.31	4.06	8.56	7.16
Baltimore	3.85	4.00	4.35	3.70	3.70	5.25	3.50	....	5.05	....	4.04	....	....
Norfolk, Va.	4.00	4.10	....	4.05	4.05	5.45	3.85	....	5.40	....	4.15	....	....
Buffalo	3.35	3.82	3.82	3.62	3.40	5.25	3.25	4.30	4.75	3.52	3.75	8.40	6.75
Pittsburgh	3.35	3.60	3.60	3.40	3.40	5.00	3.35	..	4.65	...	3.65	8.40	6.75
Cleveland	3.25	3.50	3.50	3.40	3.58	5.18	3.35	4.05	4.62	3.20	3.75	8.40	6.75
Detroit	3.43	3.43	3.68	3.60	3.65	5.27	3.43	4.30	4.84	3.40	3.80	8.70	7.05
Omaha	4.10	4.20	4.20	4.15	4.15	5.75	3.85	5.32	5.50	....	4.42	....	....
Cincinnati	3.60	3.67	3.67	3.65	3.68	5.28	3.42	4.37	4.92	3.45	4.00	8.75	7.10
Chicago	3.50	3.60	3.60	3.55	3.55	5.15	3.25	4.10	4.85	3.50	3.75	8.40	6.75
Twin Cities	3.75	3.85	3.85	3.80	3.80	5.40	3.50	4.35	5.00	3.83	4.34	9.09	7.44
Milwaukee	3.63	3.53	3.53	3.68	3.68	5.28	3.38	4.23	4.98	3.54	3.88	8.38	6.88
St. Louis	3.64	3.74	3.74	3.69	3.69	5.29	3.39	4.24	4.99	3.61	4.02	8.77	7.12
Indianapolis	3.60	3.75	3.75	3.70	3.70	5.30	3.45	....	5.01	....	3.97	....	....
Chattanooga*	3.80	4.00	4.00	3.85	3.85	5.80	3.75	....	4.50	....	4.38	....	....
Memphis	3.90	4.10	4.10	3.95	3.95	5.71	3.85	....	5.25	....	4.31	....	....
Birmingham	3.50	3.70	3.70	3.55	3.55	5.93	3.45	....	4.75	..	4.43	....	....
New Orleans	4.00	4.10	4.10	3.80	3.80	5.75	3.85	....	5.25	5.00	4.60	....	....
Houston, Tex.	3.75	4.30	4.30	4.05	4.05	5.50	4.00	.	5.25	....	6.90	....	....
Seattle	4.20	4.25	5.45	4.75	4.45	6.50	4.65	7.60	5.70	....	5.75	....	....
Los Angeles	4.35	4.90	6.70	4.90	4.60	7.15	4.95	7.15	5.95	....	6.60	10.55	9.55
San Francisco	3.95	4.50	6.25	4.65	4.35	6.35	4.55	6.40	6.10	....	6.80	10.80	9.80

*Not named in OPA price order.

	S.A.E. Hot-rolled Bars (Unannealed) 1035-1050	2300 Series	3100 Series	4100 Series	6100 Series
Boston	4.28	7.75	6.05	5.80	7.90
New York (Met.)	4.04	7.60	5.90	5.65	....
Philadelphia	4.10	7.56	5.86	5.61	8.56
Baltimore	4.45	....	....	....	....
Norfolk, Va.	....	....	....	....	....
Buffalo	3.55	7.35	5.65	5.40	7.50
Pittsburgh	3.40	7.45	5.75	5.50	7.60
Cleveland	3.30	7.55	5.85	5.85	7.70
Detroit	3.48	7.67	5.97	5.72	7.19
Cincinnati	3.65	7.69	5.99	5.74	7.84
Chicago	3.70	7.35	5.65	5.40	7.50
Twin Cities	3.95	7.70	6.00	6.09	8.19
Milwaukee	3.83	7.33	5.88	5.63	7.73
St. Louis	3.84	7.72	6.02	5.77	7.87
Seattle	6.25	....	8.00	7.85	8.65
Los Angeles	4.80	9.55	8.55	8.40	8.80
San Francisco	5.45	9.80	8.80	8.65	9.05

BASE QUANTITIES

Soft Bars, Bands, Hoops, Plates, Shapes, Floor Plates, Hot Rolled Sheets and SAE 1035-1050 Bars: Base, 400-1999 pounds; 300-1999 pounds in Los Angeles; 400-39,999 (hoops, 0-299) in San Francisco; 300-4999 pounds in Portland; 300-9999 Seattle; 400-14,999 pounds in Twin Cities; 400-3999 pounds in B'ham., Memphis.

Cold Rolled Sheets: Base, 400-1499 pounds in Chicago, Cincinnati, Cleveland, Detroit, New York, Omaha, Kansas City, St. Louis; 450-3749 in Boston; 500-1499 in Buffalo; 1000-1999 in Philadelphia, Baltimore; 750-4999 in San Francisco; 300-4999 in Portland, Seattle; any quantity in Twin Cities, New Orleans; 300-1999 Los Angeles.

Galvanized Sheets: Base, 150-1499 pounds, New York; 150-1499 in Cleveland, Pittsburgh, Baltimore, Norfolk; 150-1049 in Los Angeles; 300-10,000 in Portland, Seattle; 450-3749 in Boston; 500-1499 in Birmingham, Buffalo, Chicago, Cincinnati, Detroit, Indianapolis, Milwaukee, Omaha, St. Louis, Tulsa; 3500 and over in Chattanooga; any quantity in Twin Cities; 750-1500 in Kansas City; 150 and over in Memphis; 25 to 49 bundles in Philadelphia; 750-4999 in San Francisco.

Cold Rolled Strip: No base quantity; extras apply on lots of all size.

Cold Finished Bars: Base, 1500 pounds and over on carbon, except 0-299 in San Francisco, 500-999, Los Angeles, 1000 and over in Portland, Seattle; 1000 pounds and over on alloy, except 0-4999 in San Francisco.

SAE Hot Rolled Alloy Bars: Base, 1000 pounds and over, except 0-4999, San Francisco; 0-1999, Portland, Seattle.

EUROPEAN IRON, STEEL PRICES

Dollars at $4.02½ per Pound Sterling

Export Prices f.o.b. Port of Dispatch—

By Cable or Radio

	BRITISH Gross Tons f.o.b. U.K. Ports	L	s	d
Merchant bars, 3-inch and over	$66.50	16	10	0
Merchant bars, small, under 3-inch, re-rolled	3.60c	20	0	0
Structural shapes	2.95c	15	10	0
Ship plates	2.90c	16	2	6
Boiler plates	3.17c	17	12	6
Sheets, black, 24 gage	4.00c	22	5	0
Sheets, galvanized, corrugated, 24 gage	4.61c	25	12	6
Tin plate, base box, 20 x 14, 108 pounds	$ 6.20	1	10	9

British ferromanganese $120.00 delivered Atlantic seaboard duty-paid.

Domestic Prices Delivered at Works or Furnace—

	L	s	d
Foundry No. 3 Pig Iron, Silicon 2.50-3.00 $25.79	6	8	0(a)
Basic pig iron 24.28	6	0	6(a)
Furnace coke, f.o.t. ovens 8.87	2	4	0
Billets, basic soft, 100-ton lots and over 49.37	12	5	0
Standard rails, 60 lbs. per yard, 500-ton lots & over 2.61c	14	10	6
Merchant bars, rounds and squares, under 3-inch 3.17c	17	12	0††
Shapes 2.77c	15	8	0††
Ship plates 2.91c	16	3	0††
Boiler plates 3.06c	17	0	6††
Sheets, black, 24 gage, 4-ton lots and over 4.10c	22	15	0
Sheets, galvanized 24 gage, corrugated, 4-ton lots & over 4.70c	26	2	
Plain wire, mild drawn, catch weight coils, 2-ton lots and over 4.28c	23	15	0
Bands and strips, hot-rolled 3.30c	18	7	0

(a) del. Middlesbrough. 5s rebate to approved customers. ††Rebate 15s on certain conditions.

Ores

Lake Superior Iron Ore

Gross ton, 51½% Lower Lake Ports

Old range bessemer	$4.75
Nonbessemer	4.45
High phosphorus	4.35
Mesabi bessemer	4.60
Old range nonbessemer	4.60

Eastern Local Ore

Cents, unit, del. E. Pa.

Foundry and basic 56-63%, contract	13.00

Foreign Ore

Cents per unit, c.i.f. Atlantic ports

Manganiferous ore, 45-55% Fe., 6-10% Mang.	Nom.
N. African low phos.	Nom.
Spanish, No. African basic, 50 to 60%	Nom.
Brazil iron ore, 68-69% f.o.b. Rio de Janeiro	7.50-8.00c

Tungsten Ore

Chinese wolframite, per short ton unit, duty paid	$24.00

Chrome Ore

Gross ton c.i.f. Baltimore; dry basis; subject to penalties for guarantees

Indian and African, 2.8:1 lump, 48%	$39.00
South African (excluding war risk)	
No ratio lump, 44%	28.00
Do. 45%	29.00
Do. 48%	34.00
Do. concentrates, 48%	33.00
Do. 50%	34.00
Brazilian (nominal)	
2.5:1 lump, 44%	28.50
3:1 lump, 48%	38.00

Manganese Ore

(Nominal)

Including war risk but not duty, cents per unit cargo lots

Caucasian, 50-52%	
S. African, 48%	$0.00-$6.00
Indian, 50%	$0.00-$6.00
Brazilian, 46%	78.00-84.00
Cuban, 51%, duty free	85.00
Domestic, 48%, f.o.b. mines	$1.00

Molybdenum

Sulphide conc., lb., Mo. cont., mines	$0.75

MAXIMUM PRICES FIXED BY OPA ON IRON AND STEEL SCRAP

Other than railroad grades quoted on the basis of basing point prices from which shipping point prices and consumers' delivered prices are to be computed. Scrap originating from railroads quoted delivered to consumers' plants located on the line of the railroad from which the material originated. All prices in gross tons. A basing point includes its switching district.

PRICES FOR OTHER THAN RAILROAD SCRAP

				ELECTRIC FURNACE AND FOUNDRY GRADES										
				Low Phos. Grades										
	OPEN HEARTH GRADES*	Machine Shop Turnings	BLAST FURNACE GRADES*	Billet, Bloom Forge Crops	Bar Crops and smaller; Punchings, Plate	Heavy Structural, Plate 3 ft. and less	2 ft. and less	1 ft. and less	Cut Auto Scrap 3 ft. and less	2 ft. and less	1 ft. and less	Alloy-Free Low Phos. & Sulphur Turnings	First Cut Heavy Axle & Forge Turnings	Electric Furnace Bundles
Pittsburgh, Brackenridge, Butler, Johnstown, Midland, Monessen, Sharon, Steubenville, Weirton, Canton, Youngstown, Warren	$20.00	$16.00	$16.00	$25.00	$22.50	$21.00	$21.50	$22.00	$20.00	$20.50	$21.00	$18.00	$19.50	$21.00
Claymont, Coatesville, Harrisburg, Conshohocken, Phoenixville	18.75	14.75	14.75	23.75	21.25	19.75	20.26	20.75	18.75	19.25	19.75	16.75	18.25	19.75
Bethlehem	18.25	14.25	14.25	23.25	20.75	19.25	19.75	20.25	18.25	18.75	19.25	16.25	17.75	19.25
Buffalo	19.25	15.25	15.25	24.25	21.75	20.25	20.75	21.25	19.25	19.75	20.25	17.25	18.75	20.25
Cleveland, Middletown, Cincinnati, Portsmouth, Ashland	19.50	15.50	15.50	24.50	22.00	20.50	21.00	21.50	19.50	20.00	20.50	17.50	19.00	20.50
Detroit	17.85	13.85	13.85	22.85	20.35	18.85	19.35	19.85	17.85	18.35	18.85	15.85	17.35	18.85
Toledo	....	13.85	13.85	....	....	....	....	....	....	....	....	....	....	....
Chicago	18.75	14.75	14.75	23.75	21.25	19.75	20.25	20.75	18.75	19.25	19.75	16.75	18.25	19.75
Kokomo	18.25	14.25	14.25	23.25	20.75	19.25	19.75	20.25	18.25	18.75	19.25	16.25	17.75	19.25
Duluth	18.00	14.00	14.00	23.00	20.50	19.00	19.50	20.00	18.00	18.50	19.00	16.00	17.50	19.00
St. Louis	17.50	13.50	13.50	22.50	20.00	18.50	19.00	19.50	17.50	18.00	18.50	15.50	17.00	18.50
Birmingham, Atlanta, Alabama City, Los Angeles, San Francisco, Pittsburg, Calif.	17.00	13.00	13.00	22.00	19.50	18.00	18.50	19.00	17.00	17.50	18.00	15.00	16.50	18.00
Minnequa, Colo.	16.50	12.50	12.50	21.50	19.00	17.50	18.00	18.50	16.50	17.00	17.50	14.50	16.00	17.50
Seattle	14.50	10.50	10.50	19.50	17.00	15.50	16.00	16.50	14.50	15.00	15.50	12.50	14.00	15.50

RAILROAD SCRAP

	Heavy Melting Steel	Scrap Rails	Rails for Rolling	Scrap Rails 3 ft. and under	Scrap Rails 2 ft. and under	Scrap Rails 18 in. and under
Pittsburgh, Wheeling, Steubenville, Sharon, Youngstown, Canton	21.00	22.00	23.50	24.00	24.25	24.50
Philadelphia, Wilmington, Sparrows Point	19.75	20.75	22.25	22.75	23.00	23.25
Cleveland, Cincinnati, Middletown, Ashland, Portsmouth	20.50	21.50	23.00	23.50	23.75	24.00
Chicago	19.75	20.75	22.25	22.75	23.00	23.25
Buffalo	20.25	21.25	22.75	23.25	23.50	23.75
Detroit	18.85	19.85	21.35	21.85	22.10	22.35
Kokomo	19.25	20.25	21.75	22.25	22.50	22.75
Duluth	19.00	20.00	21.50	22.00	22.25	22.50
Kansas City, Mo.	17.00	18.00	19.50	20.00	20.25	20.50
St. Louis	18.50	19.50	21.00	21.50	21.75	22.00
Birmingham	18.00	19.00	20.50	21.00	21.25	21.50
Los Angeles, San Francisco	18.00	19.00	20.50	21.00	21.25	21.50
Seattle	15.50	16.50	18.00	18.50	18.75	19.00

CAST IRON SCRAP OTHER THAN RAILROAD

(Shipping point prices in gross tons)

	Group A	Group B	Group C
No. 1 Cupola Cast	$18.00	$19.00	$20.00
No. 1 Machinery Cast, Drop Broken, 150 lbs. & Under	18.00	19.00	20.00
Clean Auto Cast	18.00	19.00	20.00
Stove Plate	17.00	18.00	19.00
Unstripped Motor Blocks	17.50	18.50	19.50
Heavy Breakable Cast	15.50	16.50	17.50
Charging Box Size Cast	17.00	18.00	19.00
Miscellaneous Malleable	20.00	21.00	22.00

Group A includes the states of Montana, Idaho, Wyoming, Nevada, Utah, Arizona and New Mexico.

Group B includes the states of North Dakota, South Dakota, Nebraska, Colorado, Kansas, Oklahoma, Texas and Florida.

Group C includes states not named in groups A and B, plus Kansas City, Kans.-Mo.

***Open Hearth Grades** refer to No. 1 heavy melting steel, No. 1 hydraulic compressed black sheet scrap, No. 2 heavy melting steel, dealers' No. 1 bundles, dealers' No. 2 bundles and No. 1 busheling. No. 1 chem. borings, 1 per cent oil, $1 under, No. 2, 1.5 per cent oil, $2 under heavy melting steel. No. 3 bundles, $2 under No. 1 heavy melting; cast steel, $2.50 over, tube scrap $3 over, auto springs, crankshafts, $1 over No. 1 heavy melting. **Blast Furnace Grades** refer to mixed borings and turnings, shoveling turnings, No. 2 busheling and cast iron borings.

A basing point includes the switching district of the city named. The Pittsburgh basing point includes the switching districts of Bessemer, Homestead, Duquesne, Munhall and McKeesport, Pa. Cincinnati basing point includes the switching district of Newport, Ky. St. Louis basing point includes the switching districts of Granite City, East St. Louis and Madison, Ill. San Francisco basing point includes the switching districts of South San Francisco, Niles and Oakland, Calif.

Inferior Grades: Maximum prices of inferior grades shall continue to bear the same differential below the corresponding listed grades as existed from Sept. 1, 1940, to Jan. 31, 1941. No premium allowed on grades considered superior, unless approved by OPA. Addition of special preparation charges prohibited. Purchase of electric furnace or foundry grades for open hearth or blast furnace use permitted only at no more than price for corresponding open hearth grade. Exceptions: Low phos. billet, bloom and forge crops and electric furnace bundles may exceed open hearth price, and electric furnace bundles may exceed blast furnace price, if material is delivered to the consumer direct from the original industrial producer.

Commissions: No commission is payable except by a consumer to a broker for services rendered, the commission not to exceed 50 cents per gross ton. No commission is payable unless: The broker guarantees the quality and delivery of an agreed tonnage the scrap is purchased at a price no higher than the maximum allowed; the broker sells the scrap to the consumer at the same price at which he purchased it; the broker does not split the commission with the seller of the scrap, with another broker or sub-broker, or with the consumer. Commissions must be shown as separate item on invoice.

Maximum Shipping Point Price: Where shipment to consumer is by rail, vessel or combination of both, scrap is at its shipping point when it has been placed f.o.b. railroad car or f.a.s. vessel. In such cases, maximum shipping point prices are: (1) For shipping points located within a basing point, the price listed in the above table for scrap at the basing point in which the shipping point is located, minus the lowest established switching charge for scrap within the basing point; and (2) for shipping points located outside a basing point, the price in the above table for scrap at the most favorable basing point, minus the lowest transportation charge by rail, water or combination thereof. When vessel movement is involved, dock charges shall be 50 cents at Memphis, $1 at Great Lakes ports, $1.25 at New England ports, 75 cents elsewhere. New England shipping point prices computed on most favorable basing point prices; maximum transportation charge on scrap from New England, $6.65 per ton.

Scrap shipped by motor vehicle is at its shipping point when loaded. For shipping points within basing points, maximum is price listed in table minus lowest switching charge. When outside basing point, maximum is price at most favorable basing point minus lowest established charge when hauled by common carrier. When hauled by seller charges are based on carload rate for rail shipment, minimum $1.00 per ton.

Maximum Delivered Prices: Determined by adding established transportation charges to shipping point price, not to exceed by more than $1 (plus freight rate increase March 18, 1943) the prices listed in the table for the nearest basing point. Certain exceptions specified in Revised Price Schedule No. 4 (Amendment 1) apply to St. Louis district consumers, to WPB allocations, to water shipments from Duluth or Superior, Wis., to shipments of billets, blooms and forge crops from Pittsburgh and to shipments of electric and foundry grades from Michigan; to shipments of turnings to ferroalloy producers and of borings to chemical users. Delivered prices of scrap shipped under WPB allocations may exceed prices at nearest basing point by more than $1, if most economical transportation is used.

Unprepared Scrap: Above prices are for prepared scrap. Maximum prices for unprepared scrap are $2.50 less (railroad grades $3.50 less; material from which Nos. 1, 2 and 3 bundles made is $4 less) than for the corresponding grades of prepared scrap, except for heavy breakable cast. In no case shall electric furnace and foundry grades be used as the "corresponding grades of prepared scrap." Graveyard autos not considered unprepared scrap.

Remote Scrap: Consists of all grades, except railroad scrap, in Florida, Montana, Idaho, Wyoming, Nevada, Arizona, New Mexico, Texas, Oklahoma, Oregon, Washington, Louisiana, Utah. Delivered price may exceed by not more than $5 the price at the basing point nearest consumer's plant, provided sworn details furnished OPA. Permission required to exceed by more than $5 the nearest basing point price. Colorado scrap is remote scrap for Colorado consumers only.

Sheets, Strip . . .

Sheet & Strip Prices, Page 92

Sheet delivery promises, mainly tentative, are becoming more extended, and few mills will make firm commitments, even on AA-1 ratings. Inquiry and buying are limited on the part of consumers but allocations from Washington are heavy and backlogs are increasing at AA-1 and AA-2 ratings. Direct war needs, formerly emphasizing heavy gages, now include all specifications, even to cold-rolled electrical sheets. Some sellers are getting orders that had been cancelled with other mills because of hopelessness of obtaining delivery, the orders being placed as of the date of the original purchase. In some instances these shifts are made at the suggestion of WPB.

The quota system is proving effective in getting enlarged production on most pressing orders. Full rolling capacity is not engaged as allowances of semifinished are not sufficient to balance needs. Considerable tonnages are now on order for landing field mesh fabricated from sheets.

Shipments of narrow cold strip by some resellers are lower, due in part to limited hot strip available; to get hot-rolled an AA rating is required, tending toward the higher brackets. Demand is maintained for cold-rolled, orders averaging larger individually, with the ratio of low carbon slightly up, which with some mills gives a somewhat better balanced production schedule, heavily taxed annealing equipment limiting high carbon output. Deliveries under AA-2 are indefinite. Consumption for small arms accessories and ammunition, cartridge cups, links and clips is heavy. Total war requirements for stainless and alloy strip are relatively less than for some products and activity on these grades are below normal.

Plates . . .

Plate Prices, Page 93

Tank fabricators are bolstering their production by an increasing volume of work they do not normally handle, such as pontons, barge and ship assemblies and the like. This goes far in offsetting a decline in tank construction, which was first hit by limitation on civilian tank construction and later by completion of such work for cantonments, airplane bases and similar military establishments.

A substantial tonnage is being held up until the synthetic rubber program is clarified. One tank shop has had three successive cancellations in connection with one tonnage originally fabricated for synthetic rubber production.

Not from lack of steel but limitations in propulsion and other essential equipment tends to hold back small boat construction in sizes from 33 to 173 feet, particularly those over 40 feet, for which the government supplies the motors. Large additional orders probably would be placed if it were a question of hulls only, but until motors are available new contracts are held back. Numerous New England yards are building all-steel units up to 173 feet. Most parts are prefabricated and later joined by welding. Some craft are of composite construction, all of steel except planking.

An inquiry is current in the East for 10,000 tons of plates for manufacture of

Swifter Driving • Reduced Effort • Less Spoilage = 50% Less Assembly Time with Phillips Screws

It takes less time to get more done with Phillips Recessed Head Screws, and assembly workers don't wear out as the day progresses.

Phillips Screws permit one-hand starting and driving. The screw clings to the driver in almost any position — no fumbling — no slipping — no crooked driving. One hand is always free to steady the work. And, with the slipping driver hazard eliminated, electric and pneumatic power drivers are more often practical.

That isn't all! Less fatigue . . . fewer accidents . . . better work — even from inexperienced operators.

All this adds up to 50% *savings* — in *time*, which is so vital today —and *cost*, which will be a problem again tomorrow.

Any of the firms listed below will supply you.

PHILLIPS RECESSED HEAD SCREWS GIVE YOU 2 for 1 (SPEED AT LOWER COST)

WOOD SCREWS • MACHINE SCREWS • SHEET METAL SCREWS • STOVE BOLTS • SPECIAL THREAD-CUTTING SCREWS • SCREWS WITH LOCK WASHERS

American Screw Co., Providence, R. I.
The Bristol Co., Waterbury, Conn.
Central Screw Co., Chicago, Ill.
Chandler Products Corp., Cleveland, Ohio
Continental Screw Co., New Bedford, Mass.
The Corbin Screw Corp., New Britain, Conn.
International Screw Co., Detroit, Mich.
The Lamson & Sessions Co., Cleveland, Ohio
The National Screw & Mfg. Co., Cleveland, Ohio
New England Screw Co., Keene, N.H.
The Charles Parker Co., Meriden, Conn.
Parker-Kalon Corp., New York, N.Y.
Pawtucket Screw Co., Pawtucket, R.I.
Pheoll Manufacturing Co., Chicago, Ill.
Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N.Y.
Scovill Manufacturing Co., Waterbury, Conn.
Shakeproof Inc., Chicago, Ill.
The Southington Hardware Mfg. Co., Southington, Conn.
Whitney Screw Corp., Nashua, N.H.

one-ton containers for the chemical warfare division, carrying AA-1 rating.

Bars . . .

Bar Prices, Page 92

Tightness in the steel bar situation continues and demand is greater than production. This condition is expected to increase in coming months, a large factor being heavier need for steel rounds as shell production increases. In some cases the bar situation is tighter than for plates.

Under PRP allocations and gradually tighter control of carbon and alloy bar distribution, consumers are not so prone to order so far ahead. This applies primarily to new orders, many existing contracts extending well into next year, against which releases tend to increase steadily. Buying is maintained but is concentrated in fewer and larger orders.

Directives covering fixed allocations to warehouses have not yet materially improved receipts and the plan is not expected to yield relief until late next quarter.

Bolt and nut consumers have increased buying recently, an inquiry for 800 tons of steel bolts and 200 tons of wrought iron bolts and large spikes having been placed in the East. Navy yard contracts are larger, awards having been made to four mills against an opening several weeks back. A large order for manganese bar steel for delivery at Boston went to Carnegie-Illinois Steel Co., Pittsburgh.

A large source of bar demand is from shops producing small tool specialties and fixtures. Not only does this come from private war industrial plants but many new repair shops in the field, depots, ships must be equipped with thousands of these tools. Manufacturers of these tools have heavy backlogs and contracts on books run into millions of dollars.

To obtain delivery promise from most mills, even though tentative, consumers must have ratings of AA-1 or AA-2 on squares, hexagons, flats and large rounds. On small rounds from ½ to⅛-inch some mills will promise deliveries on ratings down to A-1-a. Bar shapes are considered with AA-3 rating.

FOR VICTORY TODAY AND SOUND BUSINESS TOMORROW

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This War Savings Flag which flies today over companies, large and small, all across the land means *business*. It means, first, that 10% of the company's gross pay roll is being invested in War Bonds by the workers voluntarily.

It also means that the employees of all these companies are making a definite contribution to Victory . . . by helping to buy guns, tanks, and planes that America and her allies *must* have to win. And it means that billions of dollars will be held in readiness for post-war readjustment.

Think what 10% of the national income, saved in War Bonds now, month after month, can buy when the war ends!

For Victory today . . . and prosperity *tomorrow*, keep the War Bond Pay-Roll Savings Plan rolling in *your* firm. Get that flag flying now! For full details, plus samples of result-getting literature and promotional helps, write or wire: War Savings Staff, Section F, Treasury Department, 709 Twelfth Street NW., Washington, D. C.

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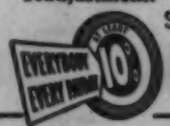


War Savings Bonds

This Space Is a Contribution to America's All-Out War Program by

STEEL

Pipe . . .

Pipe Prices, Page 93

On top priorities wrought iron pipe deliveries are possible in four to five weeks. Lap weld production is larger than butt weld and some scattered shading of secondary prices continues.

Mercer Tube & Mfg. Co., Sharon, Pa., was awarded a recent Navy steel pipe inquiry at $574,391.01, deliveries to east and west yards, Sewalls Point, Va., getting the largest individual lot.

Winter domestic needs for merchant pipe cannot be filled from present warehouse stocks and unless measures are taken soon winter plumbing troubles will be rife. Nearly all the 50 per cent of stock pipe under three inches, which could be sold without ratings, and which is replaceable under A-3, is now gone and cannot be replaced at A-3 under present conditions. Pipe bought under higher ratings, such as the AA-3 which was available in August and materials rated A-2 or better via PD-83-f forms cannot be sold unless the buyer has a priority. Warehouses hope for a solution before winter demand exhausts the small stocks held by plumbers.

Although there is shortage of skelp and piercing billets there is adequate capacity on tube mills.

Two contracts for approximately 3500 tons of cast iron pipe for government projects are before the trade, in 24-inch and under. Pipe foundries are confronted by difficulties in obtaining new molds. More than 90 per cent of tonnage now being bought or on books is rated in the AA group. Although extended, cast pipe deliveries are better than for nonmetallic materials and delays on the latter, especially fittings, reacts to the benefit of cast iron pipe for urgent needs.

Wire . . .

Wire Prices, Page 93

Wire mill bookings this month are substantially ahead of shipments with most producers, backlogs including large tonnages of balloon barrage wire. This wire, in fine sizes, is high carbon, galvanized and stranded, adding to burdened rope mill equipment. Much new stranding equipment is being added in the East. Demand for specialties is heavy, heat-treating being a choke point in some finishing departments, with all available rods being worked into immediate production. Pressure for deliveries on aircraft material is increasing.

Wire mills dependent on outside

sources for rods frequently require directives to obtain semifinished for high-rated orders and operations are confined mostly to AA priority. With indications that rod quotas will be further reduced for October, the already critical semi-finished supply situation is likely to be intensified. Demand for wire products is heavy, but spotty, production tending heavier on material for early war service. Merchant products are moving largely in direct shipments, including barbed wire, nails and fencing, with jobber quotas unfilled.

All barbed wire is for war requirements and output of fencing is sharply curtailed. Better than 90 per cent of business booked is rated AA-1 or higher, some exceptions being breakdowns in PRP needs. At the moment wire is going to rope mills in better volume, but is expected to tighten within the next ten days. Considerable equipment is engaged on heavy gage runway netting.

Nichols Wire & Steel Co., Davenport, Iowa, has been granted permission by OPA to charge a base price of $2.80 per 100 pounds for wire nails sold direct to consumers. This represents an increase of 25 cents over the ceiling price of $2.55, but the latter price is to be continued for sales to warehouses or other resellers. The principal buyer of nails from this company is the United States government, through war contracts.

Rails, Cars . . .

Track Material Prices, Page 93

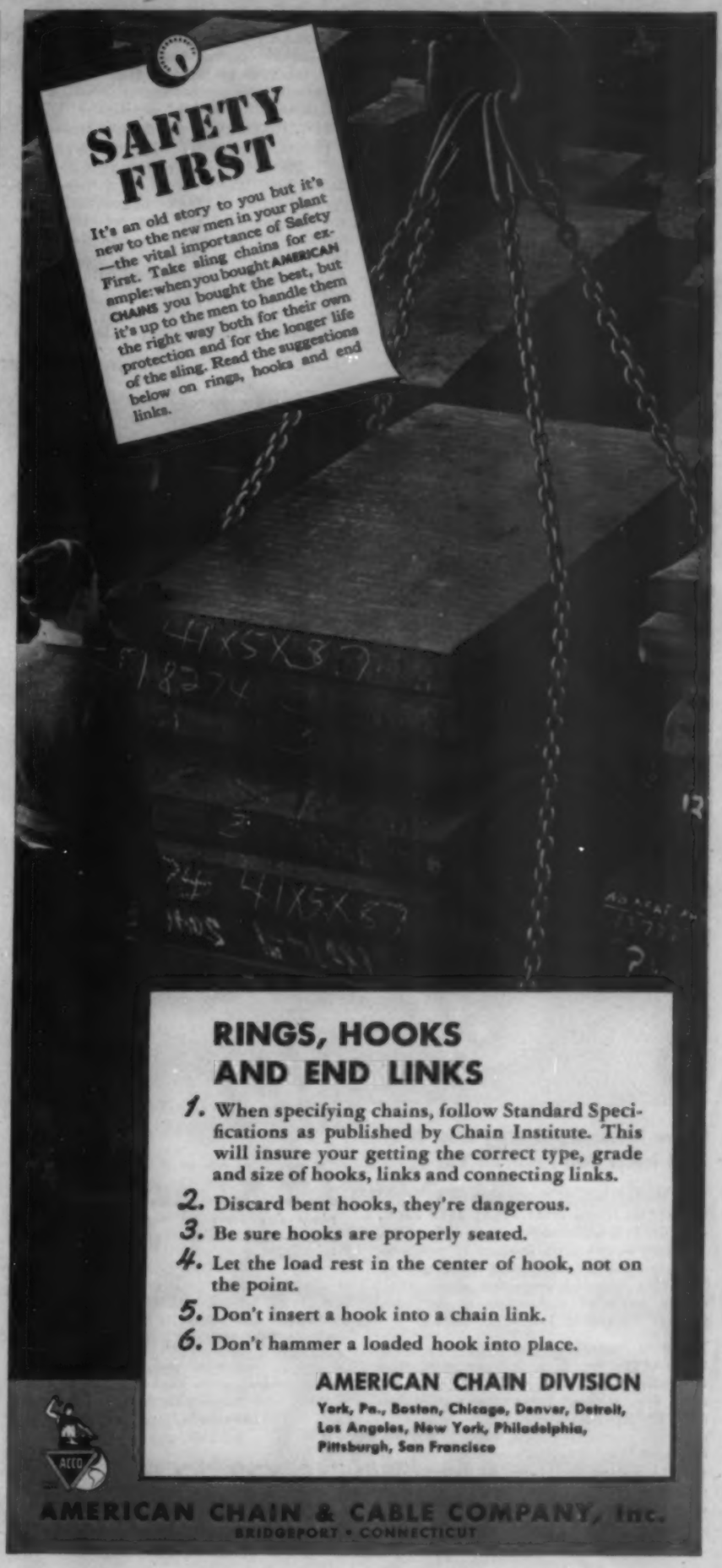
Prospects for production of the 80,000 freight cars which the Association of American Railroads says will be necessary in 1943 now seem remote. The 1942 program, operating under difficulties as to material and production facilities, will succeed in turning out about 63,000 cars for the domestic market. In addition, substantial number of cars has been produced for export under lend-lease and for American armed forces.

The 80,000-car estimate by the Association of American Railroads includes 10,000 flat cars, 2000 covered hoppers, 25,000 conventional hoppers, 35,000 gondolas, 4500 large ore cars and 3500 box cars. Obstacles to building this number of cars are lack of steel and the fact that many car builders have converted to manufacture of war materials. The steel supply situation at the moment is most critical in bars and shapes, the plate situation having improved recently, though this may be only temporary.

Structural Shapes . . .

Structural Shape Prices, Page 93

Rollings of plain structural material averaging close to 450,000 tons per month have not materially eased the pinch in shapes despite the drop in construction requirements to the lowest point in more than a decade. The answer is shipbuilding and the spread of miscellaneous fabrication to numerous structural shops. For much of this work some tools are not needed, but welding equipment is taxed. Shipyard deliveries are heavy and warehouses, under the quota plan, are getting slightly better volume. Shipyards, however, have


SAFETY FIRST
It's an old story to you but it's new to the new men in your plant —the vital importance of Safety First. Take sling chains for example: when you bought AMERICAN CHAINS you bought the best, but it's up to the men to handle them the right way both for their own protection and for the longer life of the sling. Read the suggestions below on rings, hooks and end links.
RINGS, HOOKS AND END LINKS
1. When specifying chains, follow Standard Specifications as published by Chain Institute. This will insure your getting the correct type, grade and size of hooks, links and connecting links.
2. Discard bent hooks, they're dangerous.
3. Be sure hooks are properly seated.
4. Let the load rest in the center of hook, not on the point.
5. Don't insert a hook into a chain link.
6. Don't hammer a loaded hook into place.
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not yet built up much inventory as a rule.

Backlogs of tonnage destined for construction are thinner, about two months with few exceptions, while some shops have worked off all construction; two of the largest in the east operate 70 per cent on building steel and are gradually shifting into miscellaneous war equipment fabrication.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 93

Curtailment in construction and engineering projects is restricting demand for reinforcing bars. Reduced rolling schedules under mill quotas are relative to the drop in requirements and supply continues tight, some mills not shipping below AA-3. Several projects involving substantial tonnages are held back by low priorities. Buying for Panama is active but shipment for Atlantic bases are lower, except to a Rhode Island depot, which is taking heavy tonnages.

Reinforcing bar mills hope for a change in WPB policy to avert eventual shutdown and allow at least a minimum operating rate. At present rerolling mills are allowed 30,000 tons of rails per month and there also is available as a by-product of merchant bar mills about 45,000 tons of misrolled material and rejects, which can be rerolled to acceptable products.

Current new business is less than 5 per cent of the average for the first six months this year. Backlogs are fairly heavy but are being worked off. Some contracts call for periodic shipments as far as third quarter next year. By the end of this year rollings are expected to be cut to a fraction of capacity unless new business is forthcoming.

Pig Iron . . .

Pig Iron Prices, Page 94

Pig iron allocations for October delivery are due. Applications for tonnage for that month were at about the same rate as previous months, although the melt in some lines has become lighter, particularly in stove and soil pipe foundries.

There has been a decline in melt by foundries supplying machinery castings, as production has outstripped ability of machine tool builders to absorb castings as rapidly as produced. This situation is a recent development and probably was not reflected to an important degree in applications filed for October.

Tapering in some lines has been generally balanced by expanding war work in others, no notable overall change being apparent. Some additional foundries have obtained war work and allocations have supplied them with iron. Manufacturers of stoves and other heating devices have made heavy shipments of their products and their iron inventories have been reduced.

Carnegie-Illinois Clairton No. 1 blast furnace was blown in Sept. 22 after relining. Complete relining and installation of an enlarged hearth was completed in 48 days, 21 days ahead of schedule. The only idle unit in the Pittsburgh district is the Neville Island stack of Pittsburgh Coke & Iron Co., now being enlarged.

Granite City Pig Iron Co., Granite City, Ill., has met further delay in completing repairs to its second stack and date for blowing in has been moved forward to Dec. 1. When this stack is in production the company will have output of 1100 tons daily.

Scrap . . .

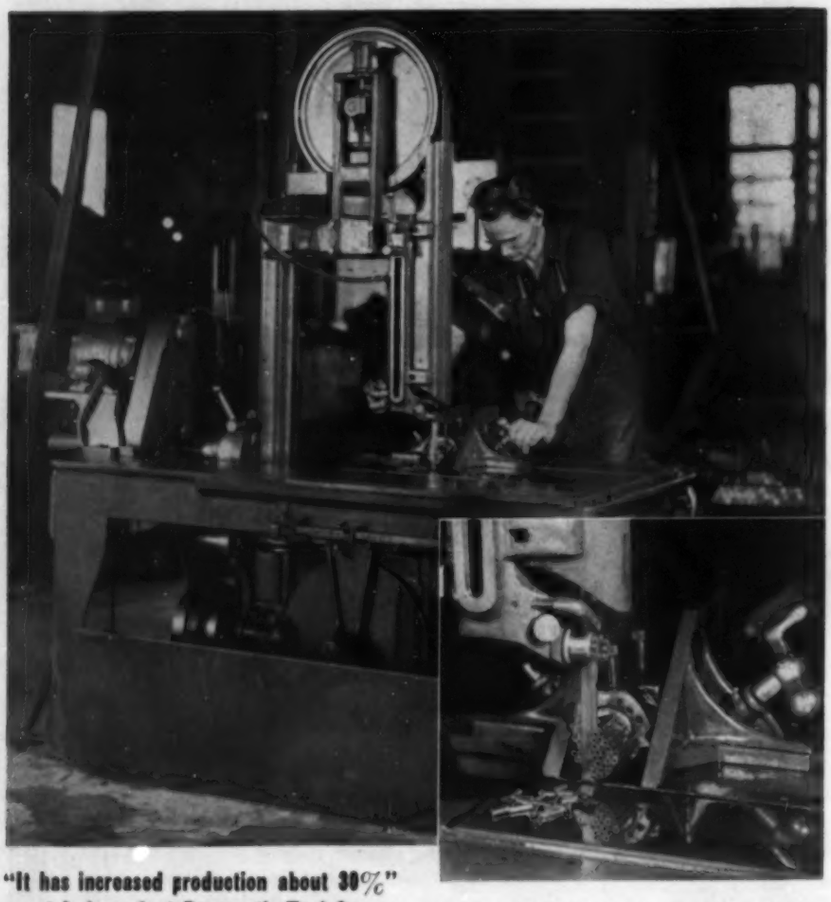
Scrap Prices, Page 96

Apprehension is being felt by the conservation division of WPB over prospects for scrap supply for the winter. Paul C. Cabot, deputy director of the division, has announced that unless local salvage committees and community groups do an exceptional job this fall steel production will be curtailed next winter.

The conservation division calls for 7,000,000 tons reserve by the first of next year to carry through the cold months when collections are slow. Monthly receipts by consumer plants have risen from 1,869,000 tons in January to 2,400,000 tons in July, an increase achieved at a time when normal sources have been much diminished.

Flow of scrap to the Pittsburgh district is not materially changed and some mills continue to dip into stock piles to maintain production at peak. No open hearths in that area are idle for lack of scrap.

Various projects in the Buffalo district are yielding good returns. Since May an average of 132 pounds of metals per capita has been collected; automobile wrecking yards contributed 11,288 tons;



"It has increased production about 30%" at Independent Pneumatic Tool Co.

Used to cut off a great variety of stock; cold drawn tubing (2335 S.A.E., 3115 S.A.E., and 3135 S.A.E.), angle iron, and round, hex and square bars in a wide range of sizes, this MARVEL No. 8 Metal-cutting Band Saw "has increased production about 30%" in the cutting-off department of the Independent Pneumatic Tool Co., Chicago.

The most versatile metal-cutting saw built, the MARVEL No. 8 a truly universal tool. It handles work up to 18" x 18" cross section; cuts at any angle from 45° right to 45° left; does mitering, notching; saves warehouse delays and "cutting extras" and saves hours of machining by roughing work to size and shape.

Cutting-off nested small diameter tubing—50 pieces per cut. On production jobs like this, the extreme accuracy and comparatively fine teeth of the blade produces smooth-edge, semi-finished pieces at every low cost.

ARMSTRONG-BLUM MFG. CO.

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5700 Bloomingdale Ave., Chicago, U. S. A.

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MARVEL SAWS

dealers' yards shipped 22,253 tons; the industrial salvage committee reports 26,014 tons from April 1 to Aug. 15; special projects section moved 6735 tons and has projects under way that will provide 23,200 tons within a short time.

St. Louis melters are receiving no more than is being consumed, though steel production is not being curtailed. One interest has taken 6000 tons from its reserves since July and now has only a ten-day supply. Another has only sufficient for one week. Considerable material collected at various points has not been picked up, because of lack of trucks and a concerted effort is being undertaken to gather these lots for preparation.

Cincinnati melters have been receiving sufficient for their needs and a slight surplus which has been added to reserves though the latter are far from normal for this time of year. Heavy melting steel has been in better supply but cast scrap is not as plentiful as recently.

Steelmakers continue to be troubled by preponderance of low-grade material. There is more than normal proportion of No. 2 steel and inferior grades and some mills ordinarily using No. 1 steel have had to use a larger proportion of the less valuable grades.

Yards find difficulty holding labor and inexperienced workers frequently make errors in classifications, with the result mills must reject anything off grade, whether it be higher or lower grade than the classification for which they are paying. To accept such mis-graded material would subject them to penalty by OPA.

Chicago district consumers are receiving enlarged supply and the recent stringency seems to have been relieved. During August automobile wreckers broke up 4489 old cars and reclaimed 6171 tons of scrap. Illinois yards in the same month dismantled 9985 cars and recovered 11,232 tons of scrap material. Wreckers find difficulty in retaining workers and also in obtaining priorities on equipment, such as cutting torches. Supply of old cars is much smaller and scrap from this source is likely to dwindle in the next few months.

Tin Plate . . .

Tin Plate Prices, Page 93

A large producer of tin plate has made a price on electrolytic plate 50 cents per base box below standard hot-dip plate and other producers are meeting the price. A Chicago mill has put its new electrolytic tin line in production but use of tin plate has been so restricted in recent months it is doubtful if its capacity can be fully engaged. For food pack cans made from hot-dip plate are required.

Bolts, Nuts, Rivets . . .

Bolt, Nut, Rivet Prices, Page 93

Bolt and nut production continues limited by inability of manufacturers to obtain bar stock. Some leading producers are not offering even tentative delivery promises on larger rounds below AA-1 priorities and on these top ratings are indicating shipments no sooner than early next year.

The situation as to supplies in general appears discouraging from the PRP aspect. Bolt and nut makers have been receiving a lighter tonnage against their quotas than they did in last quarter and it appears likely that less tonnage will be received against fourth quarter quotas, which will be established about mid-October. Meanwhile inquiry is heavy.

A contractor in Virginia is inquiring for 500 tons of heavy construction bolts, all of one size, ¾ x 18 inches. This is an exceptionally large inquiry of this character.

Iron Ore . . .

Iron Ore Prices, Page 93

August consumption of iron ore by blast furnaces in the United States and Canada was 7,155,202 gross tons, compared with 7,175,845 tons in July and 6,354,424 tons in August, 1941, according to the Lake Superior Iron Ore Association, Cleveland. The record high was made in May, this year, at 7,239,788 tons.

Cumulative consumption to Sept. 1 was 56,271,764 tons, compared with 49,712,949 tons on the comparable period in 1941.

Iron ore on hand at blast furnaces and Lake Erie docks Sept. 1 was 43,236,172 tons, compared with 37,326,533 tons a month earlier and 36,468,769 tons a year ago. Of the total on hand Sept. 1 blast furnaces held 38,124,374 tons and Lake Erie docks 5,111,798 tons.

As of Sept. 1 blast furnaces active in

Pioneered . . . and Perfected . . . by Mercury

In this unit constructed drive axle assembly

Here's the drive that's really tough! Motor and Drive are a single unit assembly, fully inclosed . . . reduces strain, simplifies construction ● Double Reduction Spiral Bevel and Spur Gears transmit the maximum power with minimum wear. Semi-elliptic Spring Suspension provides smooth riding, reduces shock ● Brakes are in the wheels for greatest safety ● Standardization of Parts and Easy Accessibility reduce maintenance time to the minimum.

For the complete story on the Mercury Drive Assembly and Mercury Material Handling Equipment write for Bulletin 201-5.

Mercury Pioneered and Perfected These Lift Truck Improvements:

The Hydraulic Lift
Snap Action Cam Operated Controller
Single Unit Double Reduction Drive Axle Assembly
All Welded Frame
Special Trail Axle Design

MERCURY MANUFACTURING COMPANY 4140 S. Halsted St., Chicago, Ill.

TRACTORS • TRAILERS • LIFT TRUCKS

the United States numbered 179, compared with 181 a month earlier and 176 a year previously. Canada had ten active stacks, compared with nine a month earlier and ten as of Sept. 1, 1941. The total active furnaces numbered 189, compared with 190 a month previously and 186 a year earlier.

Steel in Europe . . .

Foreign Steel Prices, Page 95

London (*By Cable*)—Output of steel and iron in Great Britain is expected to increase during fourth quarter, every effort being made to press all equipment to the limit. Pressure for steel plates is unabated, chiefly from shipbuilders, tank, locomotive and railroad car builders. The market for tin plate is dull.

Pacific Coast . . .

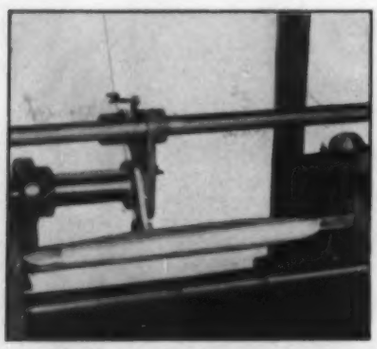
Seattle—Bethlehem Steel Co. is installing its fifth open-hearth furnace at the Seattle plant and will have it in operation by the first of October.

While scrap receipts were lower last month, an increase is noted this month as salvage drives are being stressed. In one day 50 tons of local scrap was delivered at a Seattle mill. However, the grade of material collected from homes is far from desirable.

Demand for cast iron pipe continues heavy but dealers can consider only high priorities which many cities, planning extensions, cannot obtain. An award of 250 tons at Bremerton, Wash., placed weeks ago, is still awaiting priority. Many housing projects are seeking water system materials which are difficult to obtain, 6 and 8-inch pipe being especially scarce. Valley Construction Co., Seattle, is low $133,381 for cast iron and $120,796 for transite for a water system expansion at Kirkland, Wash. About 500 tons of pipe is involved. Milton, Wash., has federal approval for proposed $27,200 water system project including storage reservoir, 8000 feet of 4-inch and 1200 feet of 2-inch pipe and fittings.

Seattle has obtained priority for 500 tons of shapes for the Spokane street viaduct, to be fabricated by Pacific Car & Foundry Co., 75 tons of reinforcing to complete one section of the project. The entire job involves 1500 tons of reinforcing awarded to Bethlehem and 1225 tons of shapes placed with Pacific Car last January.

Portland Gas & Coke Co. proposes to install storage tanks at Vancouver, Wash., for propane-butane, with equipment for manufacturing to augment the production of gas from petroleum at Portland. The new facilities are required to serve industrial demand in the Portland-Vancouver area. The project is said to have high priority and approval of federal officials.



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The FIDELITY Quill Winder for accurate, high-speed taper winding of wire—six packages of uniformly even lay and taper at one time—speeds production for manufacturers of wire cloth for filters, screens, sifters, etc.

The taper is automatically governed by control buttons which reverse and successively shorten the traverse in the same operation.

Slow acceleration prevents wire stretching and breakage. Other outstanding advantages include: hydraulic control, individual motor drive, tension control on feeder, and automatic stop motion and yardage meter.

You can wind wire from spools or brake-controlled reels depending on your requirements.

For further information and details, write to

FIDELITY MACHINE COMPANY

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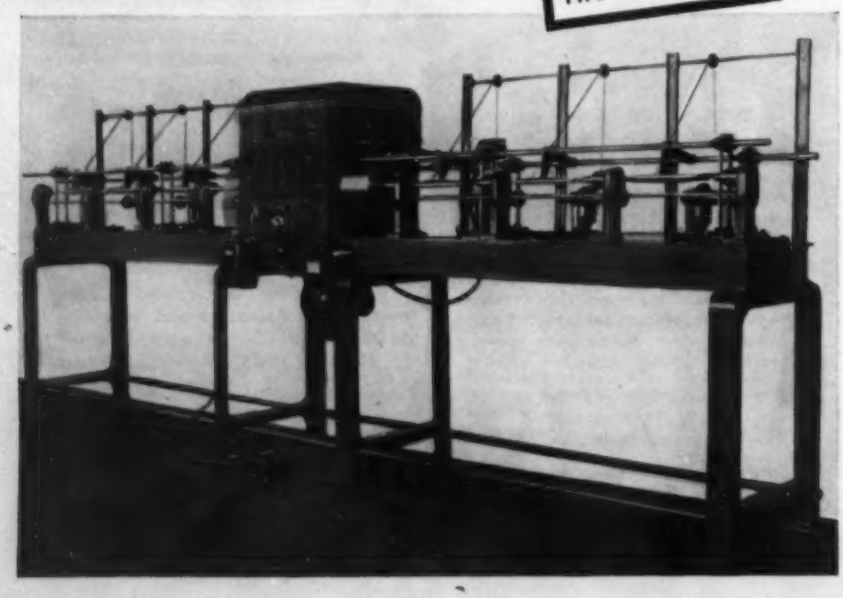
Specifications
FIDELITY QUILL WINDER

1. Spindle speed, 1750 R.P.M.
2. Six quills wound simultaneously
3. Maximum traverse, 10 inches
4. Dial control for traverse changes
5. Automatic stop motion
6. Automatic angular winding attachment
7. Automatic yardage meter
8. Winds from either spools or reels
9. Push-button control
10. ¾ HP motor
11. 2' x 13½' floor space



Canada . . .

Toronto, Ont.—Expansion in Canada's war production program is responsible for steadily increasing demand for finished and semifinished steel. Under present production rates, approximately 95 per cent, demand exceeds domestic production by better than 40 per cent, with a further shortage expected before the end of the year when new enlargements to war plants go into operation, as predicted by the Department of Munitions and Supply. Increased war output will particularly affect aircraft, tanks, ships and guns. Practically all orders for steel now being accepted by Canadian producers are directly associated with the war effort and receive the approval of the steel controller. It was reported last week that one war industry, with top priority rating, was unable to get delivery of steel, but arrangements are under way to correct this situation.

C. D. Howe, minister of munitions and supply, announced that Canada's shipbuilding program has been increased by about 50 per cent. This indicates further sharp increase in demand for plates, sheets and other materials, and with Canadian plate mills producing well above rated capacity on backlogs, it is believed that additional tonnage of plate will have to come from the United States. Rolling stock builders continue to complain of difficulty in getting steel, especially plates, with the result that deliveries of urgently needed cars are far behind schedule, some companies still trying to clean up 1940 contracts. Orders for sheets are piling up steadily, with frequent calls from automotive plants turning out war vehicles and from electrical equipment makers.

Orders for bars are pouring in and mills report backlogs on these materials extending into 1943, despite efforts to

hold down bookings. Bar deliveries, like sheets and plate, now are against approval by the steel controller. Carbon and alloy bars feature the market and even some of the more important war industries report difficulty in getting delivery in sufficient volume for all needs. While bar mills maintain fairly good rolling schedules, it is stated that it has been necessary in some instances to divert steel from these units to meet requirements of plate and sheet mills.

Structural steel lettings and demand for reinforcing bars have taken a sharp slump. Restrictions on new construction projects are going into effect and by the end of the year it is expected sales in these departments will practically disappear, except for special government approved work. Curtailment in this direction will make substantial tonnages of steel available for other war needs. At present, however, fabricators are working at top speed and are still carrying record backlogs. Lettings for the ast week fell to around 2000 tons.

Pig iron production continued at 100 per cent during the week, with no further interruption by labor trouble. No shortage of merchant iron is reported, and some producers are carrying substantial stocks of foundry and malleable grades. Demand is steady with little change from the preceding two or three weeks, but some improvement was reported in foundry iron sales, which are slightly ahead of malleable, totaling about 6000 tons for the week. Some slowing in scrap receipts a few weeks ago stimulated interest in pig iron, but larger supplies of scrap are relieving pressure on pig iron.

Scrap iron and steel receipts showed some uplift last week and further improvement is expected during the next month or six weeks. The betterment is almost entirely due to larger deliveries from rural districts. Salvage campaigns also helped to improve offerings. A. Cope & Sons Ltd., Hamilton, has received contract for the removal of rails from London, Ont., streets, and it is understood that other communities are considering similar action. The Alberta Petroleum Association, Calgary, Alta., has completed arrangements to get out 2500 tons of high grade steel scrap from the Turner Valley oil field. Incoming scrap again is said to exceed consumption and consumers are adding to stock piles. Demand continues heavy for both steel and iron scrap materials.

Equipment . . .

New York—More machine tool builders find new orders are less than shipments, the latter in most instances mounting steadily each month. A large volume of machine tools remains to be bought, some contingent on design and method changes, but unless new mass production demands arise for equipment, arms or munitions, leaders in the industry believe the "hump" has been passed in war tooling. Changes in the program account for scattered cancellations, but tools find a ready outlet for other shops; decline in buying for aircraft has been less than for other industries. Order backlogs remain at an all-time high with most shops. Negotiated contracts for various services continue active, but pool buying for second quarter, 1943, has not started in volume, although pool orders on the books are high, estimated at close to $700,000,000, most of the order to be shipped by the end of first quarter.

Boston—Purchase orders for materials including steels required by the machine tool industry, are 95 per cent in the AA-1 or AA-2 priority classification, but more difficulty is experienced in maintaining well balanced inventories. Pending final approval of PRP for fourth quarter, some orders for supplies are being placed against the margin allowed, up to 40 per cent. Bearings and d.c. motors, controls, cutting tools, with deliveries frequently quoted six months or more, are tight, limited steel available plus heavy demand for other than metal cutting tool requirements being assigned for the pinch in bearings. In steels substitutes are heavier, but tend to be retarded by engineering change approvals Castings are being supplied in sufficient volume almost without exception and the chuck situation has improved in most cases.

Seattle — Scarcity of machinery and equipment is becoming more acute as dealers are able to furnish items for only the highest prorities involving defense projects. Gov. Arthur B. Langlie, addressing the Washington Good Roads Association, stressed the reluctance of contractors to bid on state highway projects because they cannot obtain equipment. The state highway fund is in excellent condition but because of war conditions, many major jobs are being postponed.

Mexaloy refractory mixtures possess dual economical factors when employed in open-hearth and ladle use. Aside from increasing lining life, skulls come away quickly and cleanly—thus reducing labor and maintenance costs . . . Ladle bottoms packed with this super-refractory mixture give twice their normal life because slags and metal do not stick to a Mexaloy surface . . . Mexaloy is actually less expensive than ordinary loam coverings. Its inert character makes it usable in both acid and basic practice.

THE UNITED STATES GRAPHITE CO.
SAGINAW MICH.
MEXALOY

Nonferrous Metal Prices

Sept.	Copper, Electro, del. Conn.	Copper, Lake, del. Midwest	Copper, Casting, refinery	Straits Tin, New York Spot	Straits Tin, New York Futures	Lead N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 99%	Antimony Amer. Spot, N.Y.	Nickel Cathodes
1-24	12.00	12.12½	11.75	52.00	52.00	6.50	6.35	8.25	15.00	14.50	35.00

F.o.b. mill base, cents per lb. except as specified. Copper and brass products based on 12.00c Conn. copper

Sheets

Yellow brass (high)	19.48
Copper, hot rolled	20.87
Lead, cut to jobbers	9.75
Zinc, l.c.l.	10.15

Tubes

High yellow brass	22.25
Seamless copper	21.37

Rods

High yellow brass	15.01
Copper, hot rolled	17.37

Anodes

Copper, untrimmed	18.12

Wire

Yellow brass (high)	19.75

OLD METALS

Dealers' Buying Prices

(In cents per pound, carlots)

Copper

No. 1 heavy	9.25-10.00
Light	7.25- 8.00

Brass

No. 1 composition	8.50- 9.00
Yellow brass castings	5.50- 6.00
Auto radiators	6.12½-6.62½
Red brass, borings & turnings	8.00- 8.50

Zinc

Old	4.75- 5.00
New clippings	6.00- 6.50

Aluminum

Clippings	9.75-10.25
Cast	8.75- 9.25
Pistons	8.50- 8.75
Sheet	8.75- 9.25

Lead

Heavy	4.75- 5.25
Mixed babbitt	5.35- 5.50
Electrotype shells	5.00- 5.50
Stereotype, Linotype	6.00- 6.75

Tin and Alloys

Block tin pipe	44.00-46.00
No. 1 pewter	32.00-36.00
Solder joints	7.75- 8.50

SECONDARY METALS

Brass ingot, 85-5-5-5, l.c.l.	12.50
Standard No. 12 aluminum	14.50

MAGNESIUM

(12 pound rod, 4 in. diam.)

99.8% ingot, carlots	22.50
100 lb. to carlots	24.50
Extruded sticks, ¼ to 2 lb.	
Carlots	32.00
100 lb. to carlots	34.00

LOST TIME MEANS LOST LIVES

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Money is not now the only value placed on time. The war has forced time lost to be measured now in lives lost in our armed forces.

Every minute gained in our production system means saving soldiers' lives for further action against the enemy.

KENNAMETAL has met the nation's demand for increased production. KENNAMETAL bores, turns, and faces steels faster than ordinary carbides. In addition, tough jobs such as cutting hard welds, and steels up to 550 Brinell hardness, and making jump cuts, are handled quickly by KENNAMETAL.

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For use in Canada and Great Britain

Nonferrous Metals . . .

New York—H. O. King, chief, WPB Copper Branch, has announced that the supply of copper available to consumers in this country is averaging about 180,000 tons, of which 100,000 are derived from domestic mines, 50,000 from foreign sources, and 30,000 from scrap. He estimates that 98½ per cent of the monthly supply is used for war work and only 1½ per cent, or about 2700 tons, for less essential work.

Pressure for metal from industries engaged in war work is reflected in the WPB rulings that beginning Oct. 1 foundries will be able to obtain red metals only when their orders bear ratings of A-1-a or higher. Previously, WPB had informed brass and wire mills that they must request copper for November use only on orders with A-1-a ratings or higher, with the exception of orders placed with mills by Oct. 1 with ratings as low as A-1-k.

Demand for zinc also continues extremely heavy, causing government officials to hasten projects planned to increase production. Construction of an electrolytic smelter in Colorado is being considered and may be ordered if the prospective ore supply appears adequate.

The government also has started an exhaustive study of the nonferrous scrap situation, seeking means of increasing the recovery of copper, zinc, etc., from that source.

Metallurgical Coke . . .

Coke Prices, Page 93

Little change has taken place in the beehive coke situation recently, only a few additional ovens being placed in production and about an equal number are down for repairs. The market is strong, with all prices at ceiling level. Consumers have accepted the increase of 50 cents recently allowed by OPA and contracts have been rewritten to the higher level. No drop in demand followed the increase.

U.S. Steel Corp.

(*Concluded from Page 25*)

ning lines and equipment for chemical pretreatment of black plate is well along and will be completed during 1943. These new units will aid in conserving the nation's supply of pig tin, the source of which has been cut off by Japanese conquests in the Pacific."

Mr. Olds pointed out that steelmaking operations in the Chicago district have averaged over 100 per cent for 24 months, and 104 per cent for the first eight months of this year, a record which is better than for any other district. As to why this should be so, Mr. Fairless explained that the Chicago district facilities are newer and more condensed, further that the scrap situation is more favorable because the plants produce a larger proportion of their own or home scrap, and that the district is most favorably located for supplies of purchased scrap.

For the corporation as a whole, Mr. Fairless regards the scrap situation as more comfortable and better than for some time. He expects continued improvement in scrap supply and anticipates that operations within the next year will not be curtailed by shortages. He cited as reasons for this viewpoint the present general interest of the public in salvage drives as a result of educational programs, and the fact that the new War Materials Inc. is now beginning to function and holds great promise. In the case of corporation plants, Mr. Fairless doubted that production is being significantly affected adversely by the inferior quality of present scrap.

Sponge Iron Uneconomical

Questioned as to the prospects of sponge iron as a substitute for pig iron, Mr. Fairless stated that it holds little promise insofar as the corporation is concerned. Despite the fact there are some 200 patents bearing on the product, sponge iron can be produced, but not economically. The matter is largely one of iron metallics economics, in which the availability of iron ore, transportation facilities, and blast furnaces are the important factors.

Asked about the extent to which the steel industry can employ women, Mr. Fairless stated that the corporation now has more women workers than ever before and that the number is certain to increase, depending upon the shortage of men and the length of the war. How far the use of women can go in replacing men, he had no idea. To date, the situation has not become acute. Carnegie-Illinois Steel Corp., for example, has lost over 20,000 men, but there has been no real shortage.

Chairman Olds said the corporation has no finance program under consideration at present. Neither does it contemplate any change in its dividend policy. In this connection, however, he said that industry is faced with uncertainties which make it impossible to determine policy in advance. With no tax law yet passed, with no knowledge of future labor rates, and with war contracts under renegotiation, Mr. Olds declared that financial statements are little more than forecasts. As to renegotiated war contracts, he deplored the fact that no yardsticks have been established, and no one knows when or how they will be concluded.

Propeller Plant

(*Continued from Page 47*)

milled out through the center, broached, cut off to proper size, then the outer surfaces were ground to required close tolerance.

Careful analysis of this job resulted in substitution of standard rectangular barstock for the special formed barstock, and in adoption of a self-feeding

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Use either the Push-Type—Hand-Geared or Motor-Driven type equipped with 1, 2 or 3 motors operated by pushbutton control from the floor. Span up to 45 ft. between beam centers. Motor driven types have reducer units fully enclosed, running in oil. Trucks on all types are structural members of box construction for strength and rigidity. Steel wheels have double row ball bearings.

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A self-supporting crane with 220 degree swing. Capacity up to 3000 lbs. with 14' radius. Furnished with hand or electric hoist, as required.

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Lapointe broaching machine for handling it. To turn out the required volume or one machine it was found necessary to produce three complete retainers at each stroke of the machine.

As indicated in Figs. 3 and 4, the rectangular barstock is fed through a trough into the machine by a hydraulic floating clamp, which eliminates distortion of barstock and friction in feed mechanism. First three slotting broaches simultaneously cut slots in the barstock. The bar then is fed automatically to the next position by a special index device which assures exact alignment.

Next comes broach forming of the three radii on the opposite side of the bar. This is followed by another exact feeding, preparatory to the final operation. This third operation is the parting of the first three units—those which have been slotted and on which the radii have been formed, this being done by hack saw blades operating as broaches, as depicted in Fig. 4.

After the machine is in operation and the barstock has started to feed, all three operations are performed simultaneously, and at each stroke of the machine three complete units are ejected. Cost analysis made since this specially tooled Lapointe machine has been in operation, discloses that unit cost of the spring pack retainers has been reduced 75 per cent.

These are three examples of hundreds of expedients which conserve time, machines, labor and money, developed by Hamilton Standard.

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Labor

(*Concluded from Page* 38)

Roosevelt. Included in the transfer were the unexpended balances of the agencies' appropriations.

The other three services were the National Youth Administration, the Apprentice Training Service and the Training Within Industry Service.

Purpose of the transfer is to make the Unemployment Service the chief "arm" of the manpower commission. It accentuates the changes in the function of the commission caused by war exigencies. Originally it was designed to formulate policies, but the manpower shortage may cause it to be assigned actual administration of anticipated labor draft legislation.

To implement the apprentice training program, Mr. McNutt has appointed W. L. Batt, WPB vice chairman, and president of SKF Industries Inc., Philadelphia, and Channing R. Dooley, manager of industrial relations, Socony-Vacuum Oil Co. of New York, as advisors.

Additional Directors Named

Mr. McNutt also has appointed three additional regional directors for the manpower commission to supervise its activities in ten states. These include:

James Bond, director, United States Employment Service for Texas at Austin, was named director of Region X. Included in this region are Texas, New Mexico and Louisiana.

Joseph A. Smith, personnel director of Sears, Roebuck & Co., Boston, was named director of Region I, with headquarters at Boston. Included are Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island and Vermont.

Mrs. Ann Rosenberg regional director of the Social Security Board at New York, was named director of Region II, the state of New York.

Four others were previously appointed;

Bowan F. Ashe, Birmingham, Ala., Region VII: Alabama, South Carolina, Georgia, Florida, Mississippi and Tennessee.

Robert C. Goodwin, Cleveland, Region V: Kentucky, Michigan and Ohio.

Ed McDonald, Kansas City, Region IX: Kansas, Missouri, Oklahoma and Arkansas.

William K. Hopkins, San Francisco, Region XII: California, Nevada, Oregon, Washington and Arizona.

Plant Expansion, Construction and Enterprise, Government Inquiries, Sub-Contract Opportunities, Contracts Placed and Pending

SUB-CONTRACT OPPORTUNITIES

Data on subcontract work are issued by regional offices of the War Production Board. Contact either the office issuing the data or your nearest field office. Write, don't telephone, and mention key letters and numbers appearing before each item to assure prompt attention and avoid delay.

Minneapolis office, Contract Distribution Branch of WPB, 334 Midland Bank building, is seeking contractors for the following:

S.O. No. 253: Chicago manufacturer needs subcontractor for .50-calibre A.P. bullet cores. Equipment needed: Two four-spindle automatic screw machines or one 6 or 8-spindle automatic screw machine, size $\frac{7}{8}$-inch. Production will continue for the duration.

S. O. No. 232: Sources urgently required for forging 2000 one-piece links per month for duration. Oblong shape, 10½ x 5⅛ inches and 1⅛-inches diameter.

S.O. No. 208: Various small parts, automatic or hand screw machine work. AA priority; urgent.

S.O. No. 238: Local firm desires to subcontract work on micrometer adjustable spacing collars for milling machine cutter arbors. Operations require turning, tapping and threading. Threads are class 3 fit sizes from ⅞ to 2-inch arbor. Sample and blueprints at Minneapolis office.

S.O. No. 231: Chicago firm requires screw machine time to manufacture fuze parts. Drawings available.

S.O. No. 270: Sources required for manufacture of various generator parts, gears, pinions, bushings, housings, shafts, bearing assemblies, etc. Requires turning, boring and drilling capacity. Deliveries start in October, extend to March, 1943. Drawings and some parts at Minneapolis office.

S.O. No. 268: Screw machine capacity (multiple automatic) needed for six small fuze parts, four of brass and two of steel. Quantities, 100,000 and up. Samples and drawings, with prices, at Minneapolis office.

S.O. No. 266: Cutting of bevel gears, blanks furnished by manufacturer. Two gears, 2000 each. Deliveries, 400 per month. Sample and drawings at Minneapolis office.

S.O. No. 265: Subcontract work available in production quantities on the following tank assemblies: Bogie bracket, bogie arm and cap assembly, trailing idler arm, idler brackets, stop. Primary operations are boring, milling and drilling. Drawings at Minneapolis office.

S.O. No. 244: Small screw machine part for 1 and 1¼-inch machines. Operations are, turning, boring, cut-off. Quantity 100,000. Material furnished, if necessary. A-1-a priority. Also upsetting of small ¾-inch pins, operations, upsetting and cut-off. Quantity 25,000; subcontractor to furnish material. A-1-a priority.

S.O. No. 245: Three screw machine parts, hand screw acceptable; one small bolt assembly, one wire hook. Operations, turning, threading, drilling, bending, and on some parts plating. Quantities, 60,000 and 120,000. A-1-a priority. Deliveries to start at once.

S.O. No. 262: Minneapolis prime contractor needs facilities for work on punches and dies. Large capacity wanted for internal and external grinding.

S.O. No. 254: Three operations on small brass parts, two operations requiring automatic screw machines, one of which can be handled on hand machine. Quantities, 500,000 each. Delivery to start immediately. Contractor will furnish material. Samples at Minneapolis office.

S.O. No. 260: Sources needed for manufacture of aircraft engine parts, including valve tappets, studs, piston pins, bushings, etc. Grinding operations required on most parts. Samples at Minneapolis office.

Detroit office, Contract Distribution Branch, Production Division, WPB, Boulevard building, is seeking contractors for the following:

No. 2391-2394, inclusive: Prime contractor seeks production for these four jobs, quotations based on (a) subcontractor furnishing cast iron castings; (b) subcontractor performing machine operations only, prime furnishing castings; (c) subcontractor furnishing castings and performing machine operations. Order is for 18.000 on each job on delivery schedule of 350 per day, starting Oct. 15. Priority is AA2. Crank case, slab mill, two operations; horizontal boring mill. four operations; H.D. drill; sensitive drill; tapper. Cylinder. slab mill; mill; horizontal boring mill; D.D drill; sensitive drill: tapper; cylinder hone; mill vertical. Cylinder head (R.H.): disc grinder; sensitive drill; tapper. Cylinder head (L.H.), disc grinder; sensitive drill; tapper.

No. 2381: Bearing housing, stainless steel, 1¼-inch O.D., type No. 416, which is furnished. Automatic screw machine, sensitive drill, broach. Order is for 10,000.

No. 2382: Bearing retainer, stainless steel rod, 1-inch O.D., which is furnished. Hand screw machine, two operations; sensitive drill; broach. Order is for 2000.

No. 2383: Adjusting stud, stainless steel, type No. 416, ¾-inch O.D., which is furnished. Hand screw machine sensitive drill. Order is for 2000.

No. 2378: Fuze seat, malleable iron castings, which are furnished. Screw machine. 1¼-inch hexagon, H.D. drill; combined chamfer and face tool; cadmium plating. Prime contractor will also consider subcontractor furnising completed piece, casting and doing machining. Order is for 125 000 on delivery schedule of 1500 per day. Priority is A-1-a.

No. 2343: Prime contractor desires production facilities on component parts of a motor, 39 jobs involved. Various types of equipment and material involved. Requirements 4000, 6000 and 10 000 units. On each job 10 per cent of deliveries are to start Jan. 1, 1943, and 10 per cent per month thereafter. Priority is AA1. Blueprints at exhibit room.

No. 2332: Anvil. Material, WDX C.R. steel, which is furnished. Automatic screw machine, cadmium plating. Order is for up to 150,000 pieces per month.

No. 2333: Material is WDX1314 C.R. steel, which is furnished. Automatic screw machine, .663 collet; sensitive drill; cadmium plating. Order is for up to 150,000 pieces per month.

No. 2337: Vibrating damper cone. G.M. No. 1112 or 2020 steel. Screw machine; mill; sensitive drill; tin plate; speed lathe. Order is for 5000 or 10,000 on minimum delivery schedule of 2500 per month. Priority is AA-1.

Chicago office, Contract Distribution Branch of WPB, 20 North Wacker Drive, is seeking contractors for the following:

No. 39: Coupling. Turret lathes, 4⅝, 6 and 6½-inch chucking capacity. Slotting or milling machine. Material, brass, prime to furnish castings. Quantity, 1000 pieces each, production 250 pieces per week. Number of pieces, 40 of various sizes. Tolerances, liberal. Operations, first and second chucking, external and internal threading, some special threading.

No. 142: (a) Cylinder frame requiring 54 x 54-inch x 14-foot planer with two side heads; horizontal boring mill, 12-foot distance to out spindle support; Lucas-type horizontal boring mill, 4-inch spindle, long platen travel; 10-foot radial drill press. Material, steel castings, furnished. Quantity, limited. Tolerances, liberal. (b) BAE 48 x 48-inch x 18-foot planer with two side heads; horizontal boring mill 14-foot distance outer spindle support; 10-foot radial drill press. Material steel castings, furnished. Quantity limited. Tolerances, liberal.

No. 179: Coupling. 1¼-inch capacity hand screw machine, centerless grinder. Material, SAE-X1335 steel, furnished by prime. Quantity, 500. Tolerance, minimum .002. Second operation, internal broaching.

No. 184: Centrifugal plunger pin. B & S No. 00 automatic screw machine. Material, WDX1335, cadmium plated, to be furnished by subcontractor. Quantity, 600,000. Production 100,000 per month. Tolerance, minimum .003. Prime to furnish gages.

No. 210: Adapter. Three-inch capacity automatic screw machine. Material, WD1115 C.R. steel, furnished by contractor. Quantity, large. Production 500 per day. Tolerances, .002.

No. 230: Trestle fittings, for steel castings. Quantity, 5000. Production, 300 per week. Number of pieces, 11. Prime will furnish patterns, subcontractor to furnish castings, heat treated. Simple castings, sizes 2¾ x 3¾ to 10 x 12 inches. One part requires a core.

No. 232: Carriage screw; ½-inch capacity hand screw machine, thread-cutting precision bench lathe. Material, nickel silver, furnished by prime contractor. Quantity, 4000. Tolerances, .001. Threads, .375-12 U.S.S. double thread. Bench milling.

No. 236: (a) Flywheel, chucking turret lathe, 20-inch swing over carriage, 24-inch heavy duty drill press. Material, forging, furnished by prime contractor. Quantity, 4400. Production, lots of 400, 1000 and 1500. Tolerances, minimum .002. First and second operations. AA-1 rating. (b) Connecting rods and caps, for forging only, medium size and medium weight. Quantity, 4400 pieces each. Production, lots of 500, 1000 and 1500. Number of parts, 15. (c) Also requires forging facilities for two head bolts, largest diameter 1⅜-inch, length 30 inches, finished sizes. Quantity, 45,000 each.

No. 244: Hydraulic cylinder assemblies. This listing requires variety of machine operations and adapts itself to shops equipped with

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No. 602—12"x18"x8" —16 Gauge...$1.25

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milling machine, screw machine and lathe equipment of various types. Close machine work is required and parts are to be delivered completely assembled. Three types are required. Quantities to be determined. Blueprints and specimen parts on display at room No. 8, Navy exhibit.

No. 243: Cage. No. 5 Toledo O.D. inclinable press or equal, 3½-inch capacity, chucking turret lathe, second operation, medium size drill press, external, internal and face grinder. Material, AEC-3135-1 steel, furnished by prime contractor. Quantity, 1000 to 20,000. Number of parts, 12 of various sizes. Tolerances, minimum .0005.

No. 245: Gages, ring, plug, profile, width and snap. Toolroom machinery; No. 2 horizontal milling machine with vertical milling attachment or vertical mill of equal size; 6 and 10-inch swing toolroom lathe; medium size drill press; contour band saw; surface and internal and external grinders. Material, gage stock, tool steel, furnished by prime contractor. Quantity, 32. Number of pieces, 15. Tolerances, minimum .0002. Operations, turning, plain milling, contour sawing, contour milling, drilling, grinding and lapping.

Milwaukee office, Contract Distribution Branch of WPB, 161 West Wisconsin avenue, Milwaukee, Wis., is seeking contractors for the following:

WP376: Part, fuze seat. Quantity, 125,000 at rate of 1500 per day. Start as soon as possible. Approximate size, 1⅛-inch hexagon, 1 inch bored and chamfered hole. Material, malleable iron castings.

STRUCTURAL SHAPES...

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100 tons or more, one 50-ton dry dock crane, Philadelphia, to Steel Iron & Steel Co., $262,350, Tacoma, Washington; one 50-ton dry dock crane, Bayonne, N. J., to Industrial Brownhoist Corp., $210,672.20; jib crane, Panama, to Lakeside Bridge & Steel Co., Milwaukee, $108,750; one bridge crane, Charleston, S. C., to Shaw-Box Crane & Hoist div., Manning, Maxwell & Moore, Muskegon, Mich., $5801; contracts awarded by Bureau of Yards & Docks, Navy Department.

100 tons or more, 22 cranes, spare parts and tools, navy, to American Hoist & Derrick Co., St. Paul, Minn., sch. 1498, negotiated, $413,380, f.o.b. works.

SHAPE CONTRACTS PENDING

200 tons, pumping station, Torresdale, Pa., for Philadelphia board of water supply; bids Sept. 28.

142 tons, state viaduct, Erie, Pa.; bids Oct. 2.

REINFORCING BARS...

REINFORCING STEEL PENDING

2500 tons, pumping station, Torresdale, Pa., for Philadelphia board of water supply; bids Sept. 28.

1300 tons, filter station at Queen Lake, for Philadelphia board of water supply; bids opened Sept. 23.

316 tons, water supply and distribution system, army training and housing facilities, Lewis-

SHAPE AWARDS COMPARED

	Tons
Week ended Sept. 26	200
Week ended Sept. 19	8,000
Week ended Sept. 12	00,000
This week, 1941	62,861
Weekly average, 1942	19,893
Weekly average, 1941	27,284
Weekly average, August, 1942	8,072
Total to date, 1941	1,113,111
Total to date, 1942	755,927

Includes awards of 100 tons or more.

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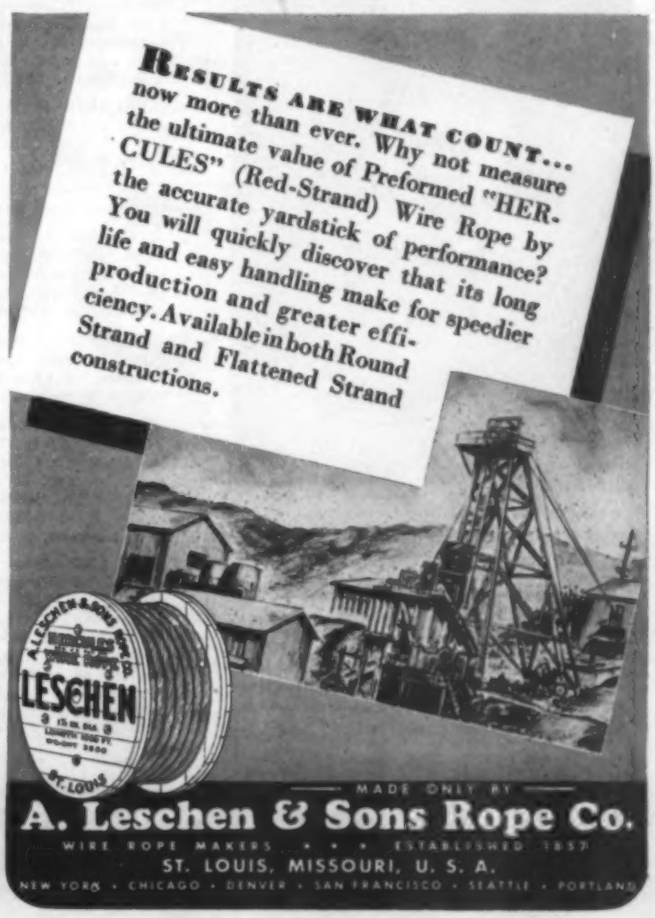
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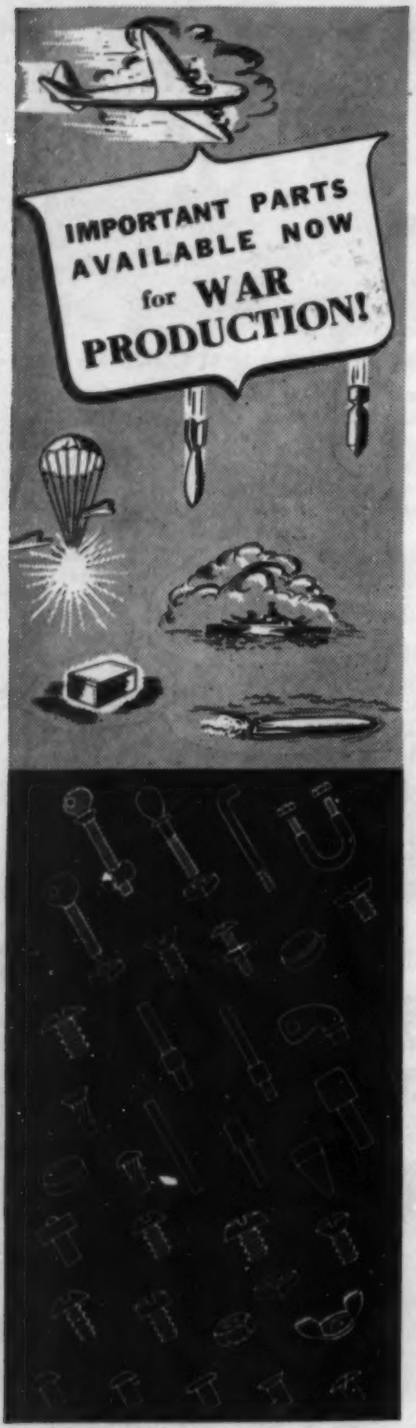

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CONCRETE BARS COMPARED

	Tons
Week ended Sept. 26	4,341
Week ended Sept. 19	13,304
Week ended Sept. 12	576
Week ended Sept. 5	4,446
Weekly average, 1942	8,944
Weekly average, 1941	13,609
Weekly average, August, 1942	7,014
Total to date, 1941	576,213
Total to date, 1942	339,886

Includes awards of 100 tons or more.

town, Ill.; bids Sept. 19.

125 tons, sewage treatment plant, army training and housing facilities, Lewistown, Ill.; bids Sept. 22.

100 tons, expansion, Crucible Steel Castings Co., Milwaukee; bids being taken.

PIPE...

CAST PIPE PENDING

100 tons or more, Navy, east and west yards, to Mercer Tube & Mfg. Co., Sharon, Pa., sch. 1474, negotiated, with separate inquiries included for Sewall's Point, Va., and San Francisco, $574,391.01.

RAILS, CARS...

CAR ORDERS PLACED

Carnegie-Illinois Steel Corp., eighty 100-ton mill service gondolas, to American Car & Foundry Co., New York.

CAR ORDERS PENDING

New York Central, twenty-five 4-8-2 steam locomotives; bids asked.

CONSTRUCTION AND ENTERPRISE

OHIO

CLEVELAND—Aluminum Co. of America, Allen B. Norton, 2200 Harvard avenue, plans three-story factory building covering 13,000 square feet, costing $300,000. Plans being prepared by Malcomson, Calder & Hammond Inc., 1219 Griswold street, Detroit.

CLEVELAND—Superior Lite Co., 1193 East 105th street, has bought site at 1203 East 105th street for future expansion. Joseph Rapport is president.

CLEVELAND—Steel Fabricators Inc., 1215 Main avenue, Victor L. Parker, president, is building one-story addition to office space at 1252 Spruce avenue, N. W., at cost of about $2500.

CLEVELAND—National Screw & Mfg. Co., 2440 East Seventy-fifth street, Mr. Burnham, purchasing agent, is building new loading dock and passage at 8210 Grand avenue at cost of about $8000.

CLEVELAND—R. E. Dvorak, 17912 Invermere, is building small shop structure costing $2500, at 19218 Redwood road.

CLEVELAND—Spero Electric Corp., B. E. Spero, president, is adding $3000 structure to present plant for additional storage space.

CLEVELAND — Harris-Seybold-Potter Co., 4510 East Seventy-first street, manufacturer of printing presses, has plans for a new boilerhouse, to be built soon. Cost estimated at $50,000, with equipment.

CLEVELAND — McGeorge & Hargett, 9400 Quincy avenue, has plans for an industrial company for a plant to cost about $20,000,000, to be financed by Defense Plant Corp.

CLEVELAND — Locke Machine Co., H. G. Smith, president, 971 East Sixty-third street, has let contract for a one-story factory and office building, 29 x 40 x 50 feet to J. L. Huntong Co., Ninth-Chester building. Cost estimated at $40,000. H. Dercum, 4500 Euclid avenue, is engineer.

CLEVELAND—Spark-Lube Inc., is being organized by interests connected with Kinetic Mfg. Co., 2012 West Twenty-fifth street. L. M. Feild, vice president and general manager of Kinetic, and R. C. Hummer, secretary and treasurer, are incorporators. Charter of new company covers manufacture of screw machine products. Leroy C. Lancer, Guardian building, is attorney and statutory agent.

CLEVELAND—Green Ball Bearing Co. is being organized as a corporation separate from the Green Vacuum Cleaner Co., 7001 Superior avenue, in which the business originated. Samuel Green, of the parent company, will be president. Headquarters and shop of the new company will be at 1965 East Sixty-sixth street. Earl W. Aurelius, 630 Williamson building, is attorney and statutory agent.

COLUMBUS, O.—Timken Roller Bearing Co., 1025 Cleveland avenue, has let a contract for two 2-story factory buildings and boilerhouse to Hadlock-Krill Co., 2169 East Thirty-third street, Cleveland, for about $150,000.

COLUMBUS, O.—Sasco Auto Parts Co., 514 Parsons avenue, is building a plant on High street to cost about $50,000.

MANSFIELD, O.—Hartman Electric Mfg. Co., 37 East Fifth street, has bought from the Reliable Jack Co., Dayton, O., its manufacturing plant at Lucas, O., about six miles from here. Equipment includes 15 punch presses and will be utilized for production of metal stampings and switch parts for war contracts.

MEDINA, O.—Permold Co., E. G. Fahlman in charge, will build a factory and office building costing $40,000. Christian, Schwarzenburg & Gaede, 1836 Euclid avenue, Cleveland, are engineers.

YOUNGSTOWN, O.—William B. Pollock Co. is extending shop and locker space by a $15,000 addition at 101 Andrews avenue.

YOUNGSTOWN, O.—Arsene A. Rousseau, Mahoning Bank building, is preparing plans for an addition to a manufacturing plant here for an undisclosed owner.

CONNECTICUT

HARTFORD, CONN.—Hartford Electric Light Co. has approved plansfor outdoor type power substation for distribution feeder service, with installation to include voltage regulators and accessories.

STAMFORD, CONN. — Shick Inc. has awarded electrical contract for one-story, 62 x 200-foot factory to John Drenckholm, 882 Hope street.

BRIDGEPORT, CONN.—General Electric Co., C. M. Snyder, manager, Bond street and Boston avenue, will build plant additions 82 x 180 and 82 x 120 feet, both two stories, at cost of about $125,000.

BRIDGEPORT, CONN.—Edwin Moss & Son Inc., 535 Grant street, has a contract for a tool engineering plant for an industrial company, location and identity not disclosed. Plant will be 94 x 192 feet, to cost $137,400.

MASSACHUSETTS

HUNGHAM, MASS. — Bethlehem-Hingham Shipyards Inc. will soon build a compressor station in conjunction with the new boilerhouse at the shipbuilding plant, at cost of about $60,000.

MALDEN, MASS.—Converse Rubber Co., 392

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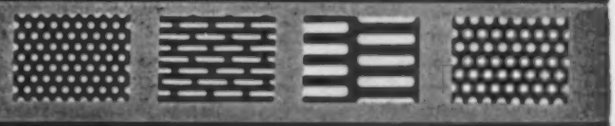

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Pearl street, will build an addition to its experimental plant. Contract has been let to James Construction Co., 46 Haverhill street, Boston. Varney & Pike, 40 Cornhill, Boston, are engineers.

PALMER, MASS. — Wickwire Spencer Steel Co. has let contract for additions to buildings 36 and 63 to the Aberthaw Co., 80 Federal street, Boston. Estimated cost is over $40,000.

PENNSYLVANIA

ERIE, PA.—Lord Mfg. Co., Twelfth street and Green Garden road, is building a one-story plant addition 60 x 300 feet, to cost about $90,000.

PHILADELPHIA—Warner Co. Inc., 219 North Broad street, will build a magnesite mill for the government, including a powerhouse, Defense Plant Corp. to finance cost. United Engineers & Constructors Inc., 1401 Arch street, Philadelphia, engineer.

RIDGWAY, PA.—Elliott Co., W. A. Elliott, vice president in charge of purchasing, Jeanette, Pa., will build an erecting shop. Prack & Prack, 517 Martin building, N.S., Pittsburgh, are architects. J. W. Ryan, Jeanette, is the company's general plant engineer.

MICHIGAN

DETROIT—Rue Tool & Gage Corp., 9825 Belleterre avenue, has been incorporated with $10,000 capital to deal in tools, dies, machinery, etc., by Albert W. Mackey, 1950 Brainerd avenue, Detroit.

DETROIT—Ceco Gauge & Tool Co., 17113 West Six Mile road, has been incorporated with $50,000 capital to deal in tools, machined parts and machinery by Stanley J. Kopec, 17113 Six Mile road.

DETROIT—Hammer Tool & Die Co. has awarded contract to Ernest Artt, Detroit, for an addition to its plant.

ILLINOIS

CHICAGO—Darling & Co., 4201 South Ashland avenue, has plans for a boilerhouse addition 30 x 40 feet, 50 feet high. Solon L. Riley, 300 West Adams street, is architect.

CHICAGO—Schmidt, Garden & Erickson, 101 South Michigan avenue, have plans for an industrial plant costing over $1,000,000. H. J. Maveety, 53 West Jackson boulevard, is engineer.

INDIANA

MISHAWAKA—Indiana & Michigan Electric Co., 220 Colfax avenue, South Bend, Ind., has plans by American Gas & Electric Service Corp., architect and engineer, 30 Church street, New York, for a power plant addition, turbine room and powerhouse, office and storage building, at cost of about $550,000.

TERRE HAUTE, IND.—Public Service Co. of Indiana, Traction Terminal building, Indianapolis, Ind., will let contract soon for a two-story powerhouse, unit No. 5. Sargent & Lundy, 140 South Dearborn street, Chicago, are engineers.

MARYLAND

BALTIMORE, MD.—Bendix Radio division of Bendix Aviation Corp., with Baltimore offices at its plant in Towson, Md., has leased 11,000 square feet of floor space in the plant of Ditch, Bowers & Taylor Inc., McMeacham street and North avenue, for expansion of production operations.

BALTIMORE, MD. — William Hutchinson's Sons, 1567 Ridgely street, manufacturer of automatic screw machines, is increasing output about 50 per cent by erection of a plant addition.

BALTIMORE, MD.—Glenn L. Martin Co., Middle River, Md., is erecting a two-story laboratory building.

ALABAMA

BIRMINGHAM, ALA.—Birmingham Gas Co., Charles B. Gamble, president, has obtained WPB permission for an expansion program to add 11,000,000 cubic feet of gas daily to its output by tapping Woodward Iron Co. source of supply and obtaining a boosted output from Alabama By-Products Corp. Program will cost about $200,000.

GEORGIA

ATLANTA, GA.—Plantation Pipe Line Co., Healey building, will build 8-inch pipe line from Greensboro, N. C., to point near Richmond, Va., under approval of Office of Petroleum Co-Ordinator, for Defense Plant Corp. Line is 175 miles long; second-hand pipe will be used; capacity 30,000 gallons of gasoline daily; cost $3,600,000.

MISSISSIPPI

VICKSBURG, MISS.—War Department has let contract and authorization for construction and expansion of manufacturing plant in Louisiana to Commercial Solvents Corp., 17 East Forty-second street, New York, under supervision of Vicksburg engineers' office. Cost over $5,000,000.

LOUISIANA

NORTH LISBON, LA.—Big West Drilling Co., Grady Vaughn, Dallas National Bank building, Dallas, Tex., considers construction of natural gas absorption plant in North Lis-

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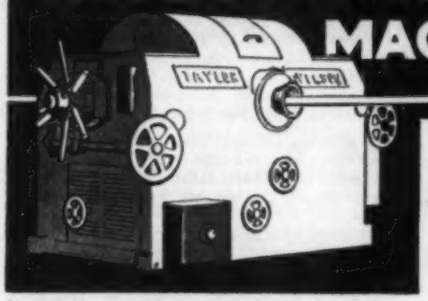

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bon area, Claiborne parish; gas to be sent to El Dorado, Ark., through 10-inch pipeline to be built by Arkansas-Louisiana Gas Co.

ARKANSAS

LITTLE ROCK, ARK.—United States engineer office, Little Rock, will be in charge of construction of a manufacturing plant in Arkansas, location not divulged, for which Sanderson & Porter, 52 William street, New York, has contract for architectural and engineering work. Cost is estimated at more than $5,000,000.

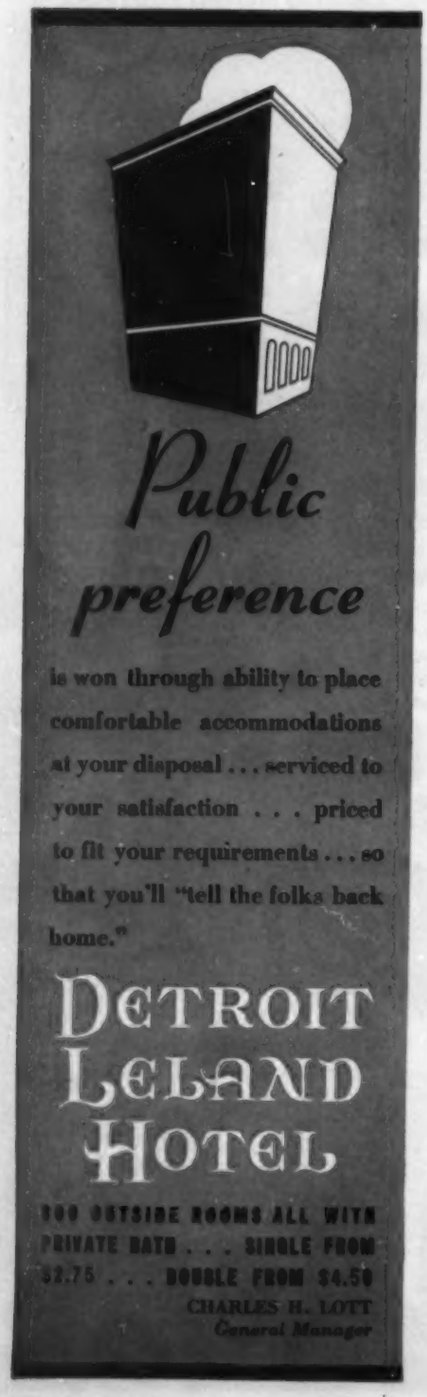
TEXAS

BIG SPRING, TEX.—War Department has awarded contract to Taylor Electric Co., Big Spring, for electric distribution and street lighting system in Ward county; supervised by Albuquerque, N. Mex., engineer office; cost under $50,000.

DALLAM COUNTY, TEX.—War Department has awarded contract, under $50,000, to Flotation Systems Inc., Los Angeles, for gasoline system; supervised by Tulsa, Okla., engineer office.

FORT WORTH, TEX.—American Cyanamid Co., 535 Fifth avenue, New York, has option on 6.2 acres for proposed erection of chemical plant to be operated by its subsidiary, American Cyanamid Chemical Co.

WACO, TEX.—War Department has announced award of a contract to Wood Engineering & Construction Co., Waco, for a gasoline fueling system in Brazos county. Engineer office, Galveston, Tex., is in charge of construction, which will cost $50,000 to $99,000.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WISCONSIN

KENOSHA, WIS. — Nash-Kelvinator Corp., 5626 Twenty-fifth avenue, has let contract for an office building and a heat treating pit to Hunzinger Construction Co., Milwaukee. Estimated to cost $42,000. E. W. Bernitt, care owner, is engineer.

CALIFORNIA

HAWTHORNE, CALIF.—Northrop Aircraft Corp., 1001 East Broadway, is building a wind tunnel test house at cost of $2800.

LOS ANGELES—Norris Stamping & Mfg. Co., 5215 Boyle avenue, Vernon, manufacturer of stamped metal goods, has plans for a boilerhouse 40 x 70 feet, to cost $30,000, with auxiliaries. Webber & Co., Hollingsworth building, Los Angeles, are engineers.

LOS ANGELES—Lee Welding Rod Mfg. Co. has opened a plant in Los Angeles. Lee Bergstrom is president, formerly vice president of Bergstrom Steel Co. Ltd. Arthur G. Brown, formerly manager for Columbia Steel Co., is associated in the new firm. Company is manufacturing welding rods of structural or mild steel type.

LOS ANGELES—Rapco Machine & Tool Co. has been formed by R. A. Pageman to conduct business at 1801 East Slauson avenue, Los Angeles.

LOS ANGELES—Coast Centerless Grinding Co., 761 East Slauson avenue, is building a plant addition 31 x 43 feet, to cost about $4000.

LOS ANGELES—Pacific Aviation Inc., Los Angeles division, has been incorporated with $750,000 capital. Directors are P. J. Brady, W. M. Jameson and J. P. Daily, all of Los Angeles. E. J. Walther, 215 West Seventh street, Los Angeles, is representative.

LOS ANGELES—Southern California Ornamental Works has been organized by B. J. Savino and will locate at 7281 Santa Monica boulevard.

LOS ANGELES—Fluid Packed Pump Co. has been formed by John B. and Vera Reilly and will be established on Workman Mill road, Los Nietos, Calif.

LOS ANGELES—Baash-Ross Tool Co., 5512 South Boyle avenue, is enlarging working floor space by addition of a mezzanine floor, at cost of $5500.

LOS ANGELES—Capital Aircraft Corp. has been organized with $100,000 capital. Directors are L. B. Gregg, West Los Angeles; O. S. McConnell and M. G. Fox, Los Angeles. Odell S. McConnell, 402 Pacific Mutual building, Los Angeles, is representative.

WASHINGTON

CHEHALIS, WASH.—Floe Machine Works and Gustaveson Iron Works have combined facilities and contracted to fabricate valves, stems and other items for the Navy. Plants will be at maximum production in 30 days.

SEATTLE—Northwest Talc & Magnesium Co., capital $20,000, has been incorporated by Ira Marshall and associates, to develop properties near Clear Lake, Wash.

SEATTLE—Anacortes Shipways, capital $50,000, has been incorporated by L. P. Clark and associates, 912 Hoge building.

SPOKANE, WASH.—Knapp Refractory Ore Processing Co., Seattle, Walter R. Alexander, president, has completed negotiations for RFC loan insuring reopening and operation of Keep Kool mine near Pend Oreille. Joint operations will be prosecuted with Idaho Lakeview mines, whose mill is being reconditioned and new equipment installed, including diesel power and flotation cells. Capacity will be increased from 60 to 100 tons daily. Production will be 90 per cent zinc and lead, mainly zinc.

CANADA

GEORGETOWN, ONT.—Smith & Stone Ltd., is receiving tenders through Kaplan & Sprachman, architects, 305 Dundas street West, Toronto, for general contract, less mechanical trades, for erection of porcelain plant here to cost upwards of $170,000.

HAMILTON, ONT.—Burlington Steel Co. Ltd., Sherman avenue North, is receiving bids through Prack & Prack, architects, Pigott building, for further plant addition, one story and basement, 30 x 30 x 30 feet, to cost about $12,000.

LONDON, ONT.—Central Aircraft, W. S. Goodeve, manager, in association with Department of Munitions and Supply, Ottawa, H. H. Turnbull, secretary, is receiving tenders through Chapman and Oxley, architects, 372 Bay street, Toronto, for construction of plant addition here to cost, with equipment, $375,000.

TORONTO, ONT.—Gray Forgings & Stampings Ltd., 710 St. Clarens avenue, has called tenders through Margison & Babcock, engineers, 210 Dundas street West, for construction of plant addition, one story, 60 x 100 feet, to cost with equipment, about $95,000.

TORONTO, ONT.—Canadian General Electric Co. Ltd., 212 King street West, has prepared plans and will call tenders for addition to machine shop at the Royce avenue works.

TORONTO, ONT.—Godson Contracting Co. Ltd., 203 Richmond street West, has given general contract to Holby Contracting Co., 279 Rushholme road, for construction of addition to machine shop on Union street, to cost $10,000, equipment extra. Edgar A. Cross, 991 Bay street, engineer.

MONTREAL, QUE.—Aero Engineering & Industries Co., subsidiary of Rakovsky Precision Works Ltd., 3480 Dominique street, has secured a site on Rushbrook avenue, and will start work soon on construction of precision tool plant, to cost about $60,000. Plans by company's own staff, M. Goldwag, chief engineer.

QUEBEC, QUE.—Department of Munitions and Supply, Ottawa, H. H. Turnbull, secretary, has given general contract to A. Deslauriers et Fils Limitee, 68 Lalement street, on a cost-plus basis, for addition to shipyards, to include several new buildings and extensions to existing structures, docks, cranes, etc., to cost about $1,000,000. O. J. McCulloch, 1440 St. Catharine street, West, Montreal, consulting engineer. Plant to be operated by Anglo-Canadian Pulp & Paper Co., Ltd.; Morton Engineering & Drydock Co., Ltd., and George T. Davie & Sons.

VALCARTIER, QUE.—Department of Munitions and Supply, Ottawa, H. H. Turnbull, secretary, has given general contract to Magliore Couchon Ltd., 325 de la Salle street, Quebec, City, for construction of eight additional buildings in connection with the dominion arsenal here, to cost about $400,000.

AMHERST, N. S.—Canadian Car & Foundry Co. Ltd., 29 Lansdowne avenue, in association with Department of Munitions and Supply, Ottawa, H. H. Turnbull, secretary, has had plans prepared and will let contracts for construction of plant addition to cost about $20,000, equipment extra.

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IN THE WAR PRODUCTION RACE

Good Grinding Wheels Win!

THE operators in your billet grinding department are important soldiers of production . . . they are in competition with enemy workmen just as determined to win. They are in a race with victory as the goal . . upon the quality of the grinding wheels they use depends, to a great extent, speedy production in your plant.

There is quite a wartime race going on in industry today. In some steel mills, billet grinding departments are beating schedules. In others, there may be a lag that is slowing up production.

There is one way to get on the winning side in the wartime production race . . have a wheel survey made right away! Often present wheels need not be changed . . just a simple adjustment of equipment may be all that is needed.

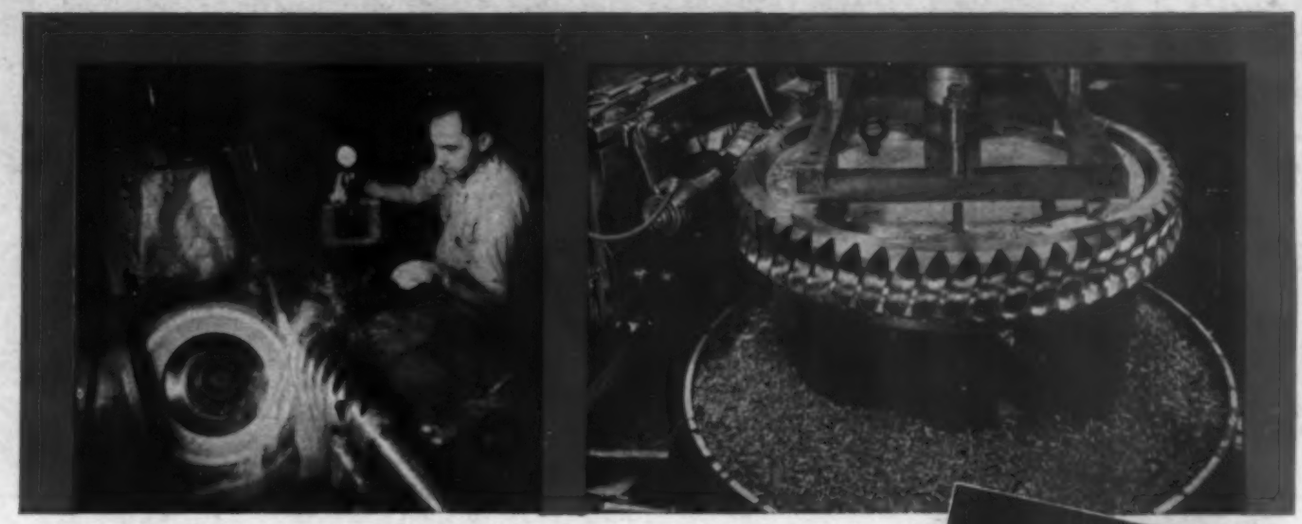
Sterling Catalog No. 42 is an important book to have around when emergency grinding wheel orders must be placed . . quickly! May we send your copy today?

To be certain about your grinding department's efficiency, call in a Sterling engineer. He can tell you, after a short inspection, if your present wheels are doing a good job. If they are adequate, he will say so. If new wheels are indicated, he will select the type for your particular grinding job. Write us today, and a Sterling engineer will call at once . . this is our contribution to early victory.

· STERLING ABRASIVES ·

THE
STERLING GRINDING WHEEL DIVISION
OF THE CLEVELAND QUARRIES COMPANY
TIFFIN, OHIO

THE WHEELS OF INDUSTRY



Prepared for *Punishment* throughout the Mill

The precision operations of worm grinding and gear hobbing illustrated above are typical of Cleveland's forethought in producing Worm Gearing for enduring service in Steel Mills.

Even a bookful of pictures couldn't tell the whole story—for the priceless element of Successful Experience can't be photographed. But *you* profit by long years of knowing-how when you install Clevelands.

We began applying Worm Gearing on Steel Mill machinery 25 years ago. Today thousands of Cleveland Units are taking the punishment on all types of Mill equipment and the demand for Cleveland grows as steel production expands.

The Cleveland Worm & Gear Company, 3270 East 80th Street, Cleveland, Ohio.

Affiliate: The Farval Corporation, Centralized Systems of Lubrication.

In Canada: PEACOCK BROTHERS LIMITED

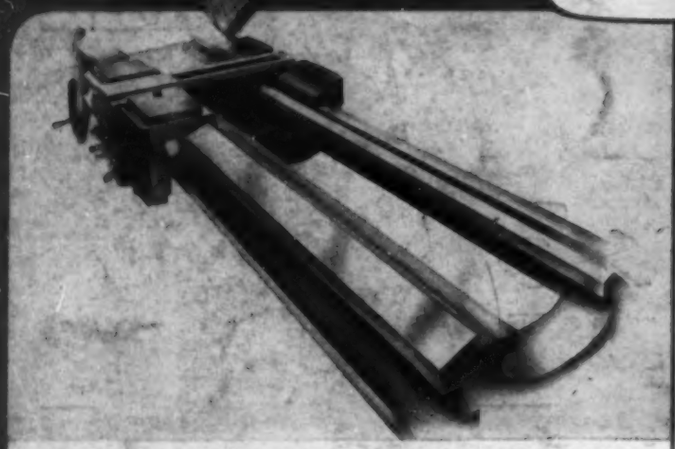
CLEVELAND WORM GEAR *Speed Reducers*

"I'm Tellin' You..."

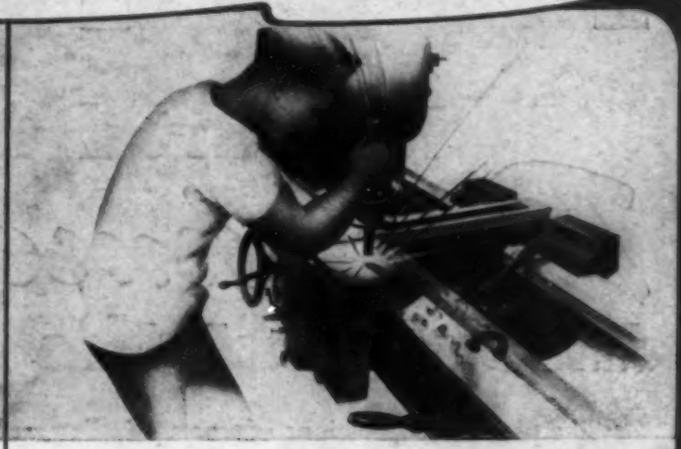
(No. 2 in a series of tips on "Keeping 'em Turning")

By Lee Hamberger — 40 years with LeBlond

Seeing as how I've been helping to build LeBlond Lathes for 40 years now, the boss figured I ought to have a few ideas about how to take care of them. So I'm supposed to spout off a little to you fellows who are running them to help you "Keep 'em Turning". I've got a pet theory that I can pretty well size up a lathe operator with just a quick look at the bed and carriage of the lathe he has been running...

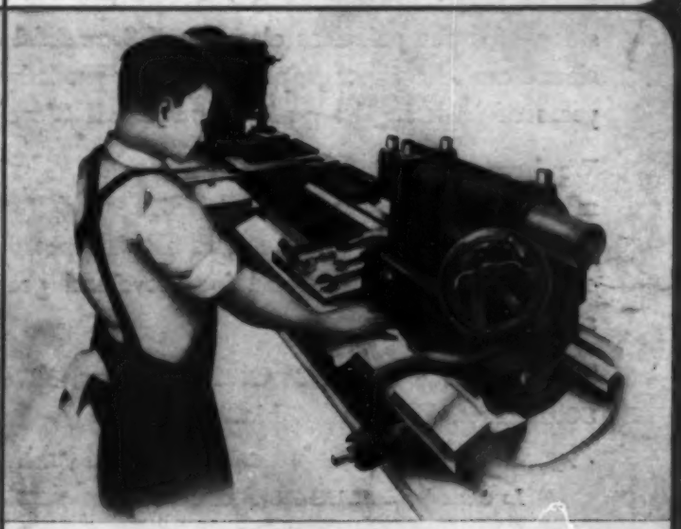


When a *LeBlond Lathe*... leaves our plant, the bed looks like this — all accurately scraped and polished.



But if the operator plays the "Village Blacksmith", using the bed or carriage for an anvil to drive mandrels in and out, and if he uses it as a rack for hammers, wrenches and chucks...

...it won't be long before he pounds out the accuracy or wrecks the lathe by feeding the carriage against an obstacle lying between the carriage and headstock.



The smart operator has a board at the tailstock end for his tools. He keeps the bed free of heavy turnings and wipes the shears clean with oil. Easy things to remember, but mighty important.

The R. K. LeBlond Machine Tool Co.

CINCINNATI, OHIO

LARGEST MANUFACTURER OF A COMPLETE LINE OF LATHES